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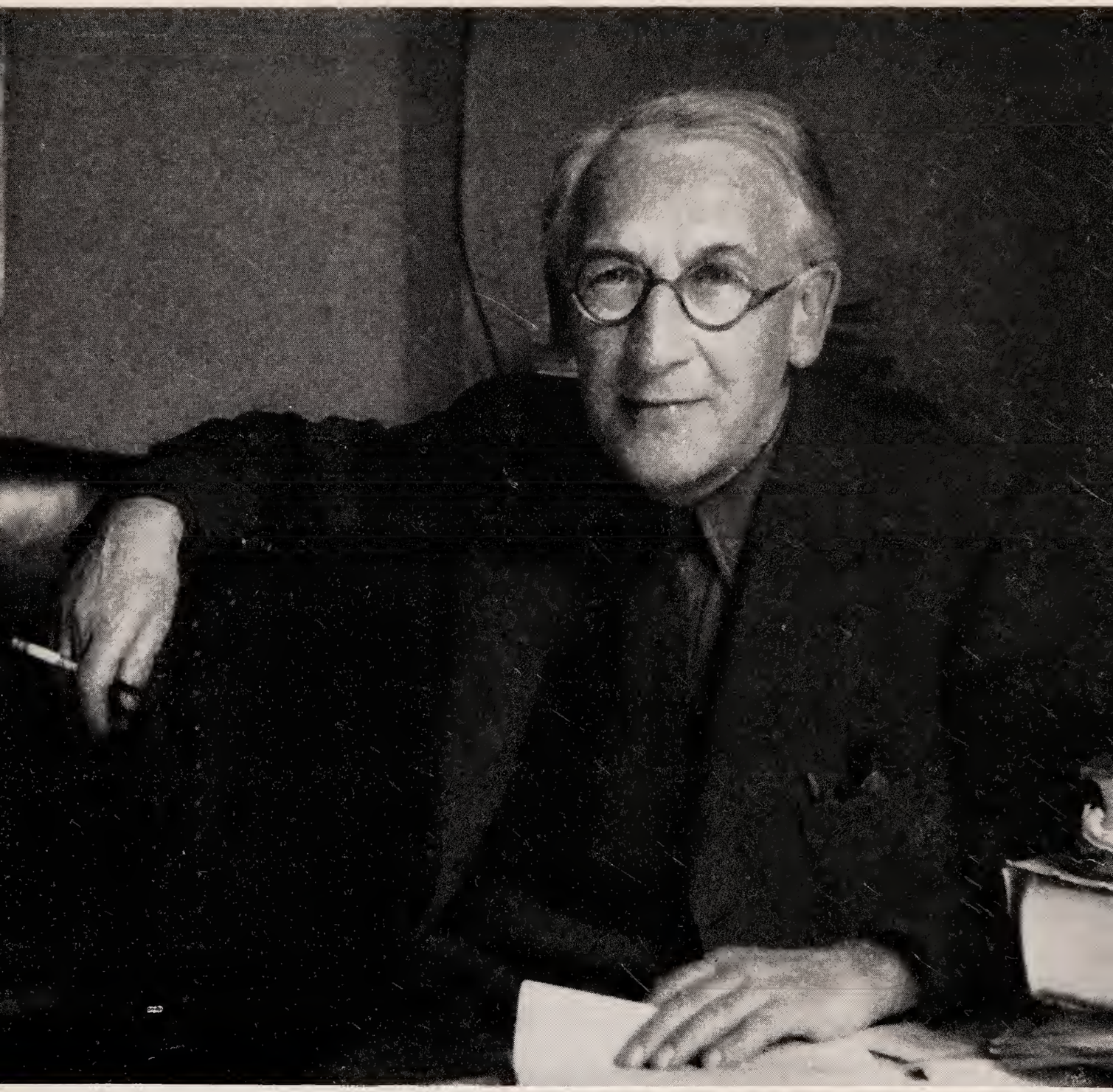
# SCIENCE, SYNTHESIS AND SANITY



G. Scott Williamson

# SCIENCE, SYNTHESIS AND SANITY

## AN INQUIRY INTO THE NATURE OF LIVING

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# Contents

# Introduction by Lord Cohen of Birkenhead

The greatest enemy to the advancement of knowledge is orthodoxy. Very few of us can escape the fixed predetermined approach to the exploration of our unsolved problems. When confronted by these in whatever discipline we may work, we traverse well trodden paths; we are the victims of our training and of our limited intelligence; we think with the thinking caps of our teachers, and in research we simply add bricks to an already existing edifice. But every now and then in most generations there are some who escape from the shackles of a rigid training, who put on a new thinking cap, who formulate novel, even revolutionary ideas, and pursue their implications.

Of these was Scott Williamson. His early work in pathology, for example, on the relationship of the thyroid and thymus glands and the lymphocyte, showed his fresh approach to oldstanding problems. Yet it was from his break with pathology that his most seminal ideas flowed. For him pathology was concerned with *disorders* or *disease;* how disease reveals itself in structural changes in the body and disturbances of its function; and what influences, both environmental and genetic bring about these changes. But the mechanisms of disease, its prevention, control and eradication, were for him of less importance than the cultivation of health. Though the study of what is wrong in man (pathology) has had and will have its conquests, these will always be limited, but the study of what is right with man in the total environment in which he lives and has his being (ethology) may lead to triumphs of limitless potential.

To investigate his concept of health Scott Williamson established the Pioneer Health Centre at Peckham in London—'the first serious attempt to found sociological work upon a biological basis.' From time to time he published with Dr. Innes Pearse, his enthusiastic disciple who was to become his wife and collaborator, several reports of the workings of the Centre, and these attracted worldwide interest and brought him an enviable reputation. But since 'a prophet is not without honour save in his own country' the reception of his ideas was less enthusiastic in his native land than elsewhere.

World War II and lack of adequate financial support brought the experiment which had begun so hopefully in 1926 to an end in 1951 after many vicissitudes. But though the experiment ended, Scott

Williamson's fertile mind never ceased from pondering over the lessons which he had learned, and which he believed could mean so much for the health of the people.

It is now ten years since he died. Dr. Innes Pearse with loving and comprehending care and convinced of their contemporary value and purpose has gathered together in this volume Dr. Scott Williamson's maturest reflections and philosophy, and with her own unrivalled knowledge and understanding of the work at Peckham has produced a record of the thinking that inspired and the lessons to be learnt from that experiment, which must be of permanent value for all those interested in the promotion of community health.

Novel ideas demand a novel nomenclature. To clothe new ideas in old words is to run the grave risk of ambiguity and misunderstanding. Even with the helpful glossary this is not an easy book to read; it needs to be carefully studied. Moreover, some of the ideas, for example, that health is not to be assessed by measurement or the statistical method, but that it is a specific quality, will not be readily accepted by those nurtured in contemporary biological thought. But whatever view we may take of Scott Williamson's concepts there can be nothing but praise for the courage and genius which designed a noble experiment which has opened new pathways of approach to both personal and community problems of health.

Dr. Innes Pearse has earned our sincere gratitude for producing this memorial to an outstanding pioneer in the study of the pursuit of health.

# Author's Note

The substance of this book derives from the thought and life-work of its senior author, G. Scott Williamson.

From student days, through years spent in many aspects of medical research and later in his own laboratory, the Pioneer Health Centre in Peckham, his unswerving preoccupation was search for an understanding of the nature of health. That is the subject of this book.

In the title of the book, the word health does not appear, its place being taken by its synonym, Sanity. The reason for this is that in modern usage the meaning of 'health' has become equivocal. Freighted heavily with the cure and prevention of disease, the word is now commonly used as a convenient 'grip', or hold-all for the manifold concerns of sickness. From that source there are only to be drawn the evidences of the *absence* of health.

Only occasionally and as an afterthought almost has the subject been reintroduced as 'positive' health, suggesting that health is an entity in its own right; that it has its own peculiar content and involves a process as yet to be uncovered.

The word Sanity, on the other hand, is less contaminated with sickness. Hence we have chosen it here as more likely to invoke a fresh approach to investigation of the nature of health and to carry that investigation naturally and readily into far-flung regions beyond the traditional bounds of medicine and its allied sciences.

So, though the discipline of both authors has been that of medicine, this book is in no way a medical treatise. And, if it leads into regions beyond the present stretch of scientific methodology, that must be taken for an indication of territory awaiting exploration if the nature of health is to be grasped.

Opening with a definition of health, the book proceeds to an examination of phenomena indubitably associated with the process of living—unmeasurable though they as yet may be. It concludes by seeking a level on which a synthesis of such phenomena with the already accredited facts of science may be reached. This synthesis is presented as an *hypothesis* upon which it may be found possible to base further experiment into the nature of living. The book stands or falls on whatever usefulness it may have for this purpose.

Two serious difficulties beset the would-be observer of health. One

is that its characteristic phenomena are so natural, so 'easy', that they go unnoticed—until disease emphasises their absence. The other is that many factors pertaining to the potentiality of health commonly remain so undeveloped that they are but rarely to be seen in any random specimen of the populace. Suitable circumstances are as necessary for their observation as they are for the experimental study of manifestations of growth in any other organic material. This may well be appreciated, for example, in reference to sex as presented in this text.

G. Scott Williamson died in 1953. By that time he had determined the argument of the thesis and had written drafts of many of its sections. But only the first four chapters, pruned and repruned, were already set in final form. These remain untouched in the text.

The main body of the book has been assembled from unedited chapters, from drafts approached from various aspects, and from voluminous notes and papers accumulated for the purpose over a number of years. It proved no easy task to grapple with the range, originality, and depth of thought these presented. Some of the more difficult material, for example, the position of the observer in terms of the hypothesis, has had to be omitted. I am only too aware that I have not been able to preserve the quality of illumination and the pith of much of the original highly personal thought and writing.

In order to find language to convey new orientations of thought, wherever possible words in common use have been adopted. Tailored for a new role, such words, while retaining their original intuitive content, have been given more precise definition. 'Home' is one such word. At other times new words have had to be coined for notions not hitherto defined: 'eclectivity', 'imperience', 'eutropy' are examples.

When introducing new words, or redefining old ones, it is usual to give a glossary pinning down the meaning the word is henceforth to carry. But in this text these words grow in meaning as the theme unfolds. To meet this difficulty a 'Dictionary of Quality' is provided.

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# PART ONE

I

# 'Living' and 'Dying'

Until consigned to the grave, man is presumed to be 'alive'. No conclusion could be further from the facts. We may occupy our life-span, that is the whole of our 'where' in space and our 'when' in time, either in 'living' or in 'dying'. It is within the experience of any established medical practitioner that a man can 'live' up to the moment of death from the moment of birth. It is on the other hand also within any doctor's experience that practically a whole lifetime may be spent in the process of 'dying', even up to three score years and ten.

Nor is it to be assumed that if we are not 'dying' then, *ipso facto*, we are 'living'. We may be in a third state – 'surviving'. The process of survival is seen characteristically in the dormancy of the seed in which both the process of living and that of dying are in suspension. This state, lethargic though hardly of the order of sleep, might be likened to a 'sporing' state: it may be a retreat from living, but it is certainly not an expression of dying It is not an a-pathy. It should more exactly be called an 'a(n)-ethy'. (cf. Aristotle 'ethos' versus 'pathos'.)

During his life-span, then, a man is not necessarily in one continuous state of living: he may be in any one of three different modes; and subject to any one of three processes. Without taking too much advantage of poetic licence, in general terms we here then will call these three modes: living, surviving and dying.

More precisely, in objective and technical terms which we shall use later in this thesis, these modes may be called *functional existence*, *compensative existence*, and *de-compensative existence*.

The groundwork for this more precise definition of the possible modes of existence lies in the work of the Peckham Experi-

ment carried on at the Pioneer Health Centre, Peckham, London, during the periods 1926-29, 1935-39 and 1947-51.[1] The Pioneer Health Centre was designed as a biological laboratory for experimental investigation into the nature of *health*;[2] it was thus primarily concerned with the healthy: i.e. the living.

The Peckham Experiment, through yearly periodic health overhaul of its members, yielded a more exact knowledge than had hitherto been available as to the physical condition of a specimen of the populace selected as likely to be 'in health'. The experiment was also planned for continuous observation of these its member-families in their daily lives. When seeing in action these individuals whose physical state was known, certain anomalies of behaviour in relation to their known physical state rose into prominence. It became apparent, for instance, that neither the individual's statements as to his condition nor the scope and pattern of his activity necessarily bore any direct relation to his actual physical state as assessable by modern physiological and clinical methods of examination. So that neither the individual's claim to be in health, nor his apparent absence of dis-ease, are reliable guides to health.

In the course of the Peckham Experiment it was found on the first overhaul, made at the time each family joined the Centre, that there were not more than 10% of persons with no recognisable clinical disorder.[3] For the time being, we can leave this presumably healthy group aside, and turn to the remaining 90% – in all of whom some disorder was found.

Already when they joined the Centre, roughly 30% were *suffering* from some disorder of which they were aware, a group which could therefore be designated as being the sick, i.e. in dis-ease. This sample of the populace examined manifested conditions of a pathological nature which are well-recognised and are those for the alleviation of which the profession of medicine traditionally exists.[4]

[1] *The Case for Action.* Scott Williamson & Pearse. Faber & Faber (1931) London; *Biologists in Search of Material.* Scott Williamson, Pearse & others. Faber & Faber (1938) London; *The Peckham Experiment.* Pearse & Crocker. Allen & Unwin (1943) London.

[2] Appendix 1. [3] Appendix 2.

[4] see analysis of the nature of disorders found: *Biologists in Search of Material*, sec. III, part 1, pp. 52–5.

That left a residue of some 60% who fell into neither of the above categories. This 60% of individuals of all ages (over the age of five) constituted a group in all of whom some disorder of recognised pathological nature was disclosed by the diagnostician, but of which disorder or disorders the individuals themselves were either wholly unaware, or blithely ignored. The characteristic common to them all was that they believed themselves to be in health and to be acting accordingly.

To classify with the diseased this anomalous group, which on examination disclosed disorders of the *same* nature and often of the *same* severity as those afflicting the frankly diseased, was obviously insufficient and misleading, for the difference in the behaviour of the two groups was arresting. Hence a further classification had to be made of this group, based upon what the individual himself felt his condition to be.[1] From the subjective point of view of the individuals themselves, this category included all those who, in spite of the disorders found to be present, felt they were fit, or in their usual health. They differed conpicuously from the sick in being able to sustain their positions in their work and in society without any professional assistance.

Enquiring more deeply into the two categories of persons found to have disorders, it became clear that the underlying process whereby one group of individuals maintained a feeling of well being and remained oblivious of their actual physical state of dis-order, lay in their power of *compensation,* a process well-known to the clinician.[2] In general terms this means that on the one hand they were drawing on the body's ample reserves, and/or on the other hand, were – consciously or unconsciously – limiting their environmental excursion to meet the limitations imposed on them by their concealed and insidious disorders. The progressive failure of their powers thus being successfully masked by either or both of these procedures, they were enabled apparently to remain 'well'. In fact, however, they were progressively losing the resilience of health that the body's reserves sustain and promote.

From observation of the individual's behaviour, while it is

[1] *Biologists in Search of Material,* pp. 83-9.

[2] For fuller discussion on 'compensative existence' see: *The Case for Action,* p. 143; *The Peckham Experiment,* pp. 101-7.

easily seen that compensative existence is distinct from decompensative existence (i.e. what is commonly called disease), it became clear that compensative existence is not to be regarded as the *same* as the health, or the wholeness, of functional existence. To quote from *The Peckham Experiment*[1] '. . . compensated disorder constitutes a limitation of *functional capacity* for action and hence a threat to the organism and its parts, even though the operation of the mechanism that counters the threat by this very process of compensation is itself an expression of a . . . capacity for health.' And again '. . . this . . . limitation of function is robbing the individual . . . of his potentiality for continued growth and development: i.e for health.' These people were, in fact, not living to the full; they were surviving – in compensation.

To understand the various processes in which the organism may be engaged, it is necessary to recognise and to distinguish between compensative existence – however healthy the individual may himself '*feel*' – and full living, or functional existence in which the total potentiality of the organism is free to find expression as circumstances demand; and where no limitation is placed upon free exchange between the individual and his environment.

It is obvious, then, that health cannot be assessed or determined in terms of the organism alone in isolation from its environment. Health lies essentially in the functional action of the organism and environment.

Every biological entity, individual or organism, is a machine. There is a school of philosophers which has explained life as a manifest of mechanism – the mechanists – and an opposed school of philosophers who have sought to explain the machine as a manifest of 'life' – the vitalists. The biologist, however, acting in his professional capacity as a scientist, is not concerned with explanation or with proof of a premise. Scientific technique proceeds otherwise: it takes matter, energy or life as that which is to be examined, and seeks to know *how* they behave.

From observations in experimental conditions we see the biological machine or mechanism working differently in each of the three types of existence – living, surviving and dying. Each

[1] *The Peckham Experiment,* p. 105.

mode has its own special method of securing raw material and upon this raw material the machine operates in accordance with materio-dynamic law in a way suitable to the material it consumes. Thus, the end-product of the turnover in each mode is also different, governed presumably by the raw material consumed and the modifications of the machine in accordance with the different raw material which it has consumed. This will become more clear as we proceed.

Further, we shall see that neither the raw material, nor the methods of operating, nor the end-products of each type of existence, are merely quantitative variants of the *same* process. That is to say, living is not a maximum, survival not a mean, nor dying a minimum, of the *same* process.

For example, as much energy may be thrown into the process of disease or dying as into the process of living. Indeed the frenzy of the climax of dying may exhibit such vigour and intensity of power output as to appear almost super-human. But while each state can display the same energy and an equivalent materio-dynamic turnover, nevertheless, as we shall find later, the process involved in each mode is distinctive – if not specific.

A further curious fact is that, so versatile are man's emotions, he can enjoy either living, surviving or dying so that existence in whatever state may *feel* and seem worthwhile. In that respect the 'organ' of emotion is no different from any other organ of the body. Whether in living, surviving or dying, the lung for example, inspires, expires, doing the best possible *in the circumstances;* and this is no small source of satisfaction to the individual. This satisfaction – the basis of happiness and enjoyment – can follow either from the smoothness of acceleration in the accelerative process of living, or from the steadiness of stabilisation in the stabilising process of survival, or from the minimising of friction, as it were by effective 'lubrication' in the decelerative process of dying. Perhaps, indeed, the widely diffused emotional satisfaction that may appear as common to all three states, is the main reason why the three modes of use of the mechanism hitherto have escaped observation and study as independent entities.

Unfortunately for the organism, the sense of satisfaction accruing from these states of existence – that of functional exist-

ence excepted – is seriously misleading, for it permits of a lack of awareness of – and so of concern for – defects as they arise in the body mechanism. This is the more unfortunate because unlike mechanical operation, biological action, in all its phases is cumulative: is, in fact, auto-cumulative. In the case of health, i.e. functional existence, this process is neither mere 'acceleration' nor mere 'cumulation', as will be seen later. Whereas in the stabilising process of 'compensation' a biological 'engine', step by step getting rid of its 'load', comes to operate less and less upon extraneous material; that is to say, it progressively limits the range of its environmental excursion, so limiting the range of its turnover. When this process is continuous, each step in the deceleration of the engine effecting a new state of equilibrium, nevertheless brings with it a renewed *feeling* of satisfaction – a sense of 'well-being' no matter how fleeting. But the progressively unloaded engine is apt to become increasingly decelerative till compensative effort ceases to be effective and the reactive process associated with disease ensues. This unloaded engine in turn becomes increasingly decelerative until the engine stops – which is the fate of all biological engines that cease to operate against 'load'.

At first sight, the reader may find nothing remarkable in that feelings of emotional satisfaction accompany various changes of bodily state. Since, however, fluctuations in his own feelings may occur within whichever mode of existence he is enjoying, his feelings about his state are not necessarily to be correlated with a change from one state to another, and so can be no sure guide to a knowledge of what he, in fact, is grappling with: namely anatomical, physiological and biological changes in the condition of his bodily mechanism, all more tangible than personal feelings.

Hitherto the emphasis of the experimental interest and attention of the scientist has fallen heavily on one only of these three expressions of man's existence – that of disease or de-compensative existence – the process of dying. Study of the processes underlying disease in all its forms has been carried on extensively and deeply down the centuries. Both the empiricism of medicine and the science of pathology have produced and continue to produce at an ever-increasing rate a spate of valuable

facts on this aspect of existence. And it must not be assumed that medical scientists and empiricists are alone in the exclusiveness of their contact with and pursuit of the study of dis-ease and dying. Psychologists, sociologists, agriculturalists, economists, educationalists, statesmen – even those devoted to the study of divinity and religion – are equally practised in the alleviation and remedy of dis-ease. Not all these practitioners are, perhaps, as scientific as the doctors – for medicine long since turned to science for enlightenment. The other practitioners have not all established branches of science proper to their interests – though some have borrowed scientific technology from the physical sciences in an attempt to do so. Hence with these other practitioners diagnosis is still too apt to be determined by the remedies they have at hand, which is the basis of quackery.

Since disease, associated with the process of dying, is the most obvious, the most self-declamatory state of existence, it is easy to understand that it should have had first attention. The result, as far as it goes, has been most satisfactory, for the span of man's existence has been increased by a decade or more through the application of measures, scientific and empirical, for the remedy and prevention of disease – by the sociologist, the educationalist, the economist, and the statesman, as well as by the doctor.

But this great achievement of making the process of dying easier, smoother, less painful and more prolonged, has only been effected by working on the basic assumption that the process of dying, common to men, begins in the cradle or earlier, and ends in the grave: that man is, in fact, born but to die. What is the result? Marriage becomes an economic disaster: pregnancy a 'disease of nine months duration': birth a major accident, clumsily designed, demanding interference and anaesthesia: infancy the opportunity for repression: childhood a breaking-in to the curb and bit: adolescence a docilisation, a taming to fit the animal for the circus cage of society – with Whipsnade for the few. In fact in every phase of society and civilisation and at every step, means are adopted to anticipate, to prevent or to correct the emergence of any mystery locked up in the seed of humanity; as though living were some ghoulish supernatural thing of which we were afraid or ashamed. We have *remedies* for everything: even for living. And so successful are our remedial pro-

cedures and preventive measures that the great majority of us are almost 'cured' of that fell disorder, living.

Vital statistics demonstrate that the expectation of life has been extended. But it is the 'expectation' rather than the living that so far has been extended; for the majority of the ageing are in an advanced state of dying. It might be said that the process of dying now takes longer to reach death; there are diabetics of seventy and over whose dying began at ten years of age. We have undoubtedly created circumstances highly favourable to the process of dying. So much is this true that we are constrained to enquire whether in fact medicine, which claims to have conquered disease, has but 'enslaved' or domesticated it.

There is a curious mathematic that reads: the more spent on sickness the greater the health of the nation. Since the machinery of our bodies can be used in at least three ways, for the process of living, surviving or dying, the accuracy of this premise needs careful checking. It is possible, for instance, that instead of being enhanced, living may be abated in favour of compensative existence; or even that protective and preventive measures may succeed merely by prolongation of the process of dying.

But we do not rail, neither do we deride. Up to now there has not been available any *scientific knowledge other than that derived from the study of disease and the study of remedy* to guide man's attitude towards *living*. So long as that is so, so long as scientific knowledge is derived only from interest in and contact with disorder and disease and is sustained by a supreme and ever-growing facility with remedies and expedients, so long will this philosophy of pessimism continue to prevail in subconscious motivation.

Since man is forever planning and designing on the basis of such of his articulate experience as is shared with, or connived at, by an articulate majority, it is only natural to expect that the direction of his 'planning' will be influenced by the particular state of existence found and acquiesced in by that majority of society. It is easy, therefore, to understand that we should find nearly the whole weight of 'planning' in all branches of human activity, directed to the application of remedy and prevention, and to an ever deeper scientific study of the cure and prevention of disease and injury.

What, then, has to be found to further the evolution of civilisation? It is some illumination other than that deriving from the study of dis-order: i.e. of pathology. Science, working within the sheltering aegis of Christianity, though outcast by its priests, has already banished man's first primitive fear – the fear of nature – and in so doing has presented man with a potential material plenty. The value of science to mankind is in fact, then, an ethical value: for 'fear' is a direct measure of lack of knowledge. The benefits flowing from science have been the fruits of *humility and obedience to natural law.*

Two other of man's ethics await realisation, and by the same token. One is to banish man's fear of man: the other to translate 'fear' itself into '*love*'. Since, approached in all humility, nature's mighty powers are so benign, as science has shown, we must presume that potentially *man himself* is as benign – did he but know, and were he but obedient to, the natural laws and regularities of cosmos that enfold him.

It is not, then, man's habituated experience but science, man's greatest instrument of knowledge, which must guide him to secure for mankind these further realisations. It is science, not scholarship, which must direct the future.[1] At this juncture in history, when man has acquired so much knowledge of the physical world, that which alone can save mankind from his own destruction is some new expansion of science. It can, moreover, be no mere technical advance – which should not be equated with the advance of science.

It is burdened with this conviction that we turn from the field of strict physical science to the as yet relatively unexplored field of the animate world; to the study of living. Within that world our chosen approach is first to the study of man himself—in health, or wholeness.

Where, then, are we to begin? As a first principle, we find that biology covers several major processes: briefly, living, surviving and dying. All three are open to organism, and any of them may extend over the whole life-span of a biological entity. One of these, the process of dying, has already been explored deeply and widely in the science of pathology; the cure, prevention and compensation of disease and disorder has been an age-long

[1] Appendix 3.

pursuit.[1] The process of living, the study and cultivation of 'ease' and 'order' in nature, has yet to be explored.

We pursue our ways unaware of order and ease, for in the very nature of the life process we are enjoined in their estate. But to love health above ill-health, not merely as an 'ideal' or fetish but in action, we need knowledge of how to cultivate *order*, even to a greater extent than knowledge of how to cure and prevent *dis*-order.

For such a study – the very antithesis of the biological science of the process of dying, pathology – there is not as yet even a name, let alone any body of enquiry by experiment according to the procedure of science. As distinct from, and in antithesis to, the study of pathology, the study of the process underlying ease and order in nature might well be called the study of *Ethology*.[2]

This thesis is a tentative approach to just such a body of knowledge.

[1] Appendix 4.

[2] see *Lancet*, 16th March, 1946, p. 393. See also Appendix 5.

II

# The Concept

What does 'health' look like? How does health, the process we are here calling functional action, present itself to the eye of the scientific observer? We will begin with a definition: health, i.e. living, or functional existence, depends upon the development and working of a faculty of the organism – *the faculty for mutual synthesis of organism and environment*.

This definition is a condensed technical expression that has arisen slowly out of a life-search for an understanding of the nature of health; one carried on in the first place through an extensive study of pathology, and subsequently brought to a more critical focus through the facts disclosed in study of the nature of health in the experimental conditions of The Pioneer Health Centre, Peckham.

The basis for this definition of health will be found in *Biologists in Search of Material* and *The Peckham Experiment*, from which we give below two short extracts indicative of the stages by which the definition was reached:

> *Biologists in Search of Material* (1938)
> The adaptive function of the organism is, in health, directed to the digestion and synthesis of the external material and conditions of the environment. 'Health' is thus a process: not a state. It is a cumulative as opposed to a spending process: not defensive but acceptive. p. 92 (23).
> Health ensues when the organism is not turned in on itself to effect a compensation but is exercising its adaptive function on the total situation, i.e. on the environment rather than on itself. p. 89.

*The Peckham Experiment* (1943)

. . the environment is the source of diversity as well as the recipient of the diversification of that which is taken from it by the organism. Each different factor, or change in the environment that impinges on the organism, each new food particle digested, each new co-ordination learned as a result of (organismal) experience made possible by any new environmental disposition, results in the development of further specificity in the organism and leads to a still more versatile power of apprehension of further environmental contributions. Also, and consequently, it leads to still further novelty in the products (of that organism) subsequently received into the environment. So that, in the presence of adequate nutriment, function implies an ever-increasing diversification, in the organism and in the enviromnent alike. p. 24.[1]

This is the functional picture of life in flow. It is to be seen in a progressive *mutual synthesis participated in by both organism and environment. It is 'wholeness'* – health. p. 15.

The foregoing definition will necessarily lead the reader into a relatively unfamiliar field, and therefore will need dissection, clarification and some patience.

Let us begin with the *environment.* In this definition lies the implication that in the process of *mutual synthesis,* the environment acts as if it were facultatively as living as the organism it sustains. Or, stated another way, the total environment and the organisms it contains, constitute *one organismal entity.*

Here, then, we have a concept which postulates that livingness is an attribute of the working universe; as opposed to the generally held idea that livingness is the perquisite of animal and vegetable forms alone. Livingness not being an exclusively human perquisite, it is perhaps as well to bear in mind that in using the term we do not imply that the environment – the working universe – is human, superhuman or sub-human.

Like every other scientific concept, this concept is merely a

[1] The words in brackets have been added here, the passage having been removed from its context.

technical instrument: an invention. No act of faith, no profundity of belief, is called upon to sustain it as a truth. A scientific concept is a device – a toy, if you like – through which to look at things, situations and events and thereby gain a new view of them. The scientist uses a concept as a guide to study: as a key to a plan of enquiry. In this concept, that the environment is as living as any organism living within it, we have then just one such key.

Let us turn aside for a moment and look at examples of how concepts are used by the scientist. Newton's concept, or rather the concept of the Newtonian era from which has grown modern physical science, postulated that gravitation is a universal. Prior to that every falling or moving mass was presumed to contain little parcels of motion added to it from some supernatural, or some natural source – god or the wind – or even man himself. Biology is in very much that same position now, for every recognised biological entity has in it, it is presumed, a little or large parcel of livingness; or, stated more soberly, livingness is regarded as pertaining solely to the entity itself. There has been no 'universal' to which the livingness of the biological entity was referable and in terms of which it was measurable, as the mass and velocity of any entity in the physical world are referable to a universal, namely Energy. This does not, of course, mean that Energy is not manifested in the operations of the living entity.

The Newtonian concept was, as it were, a 'lens' giving a certain clarity, or 'resolution', to scientific vision, thus enabling the scientist to see matter and motion each on its own separate co-ordinate, track or tracing. Using suitable mathematics, in the light of that concept matter and motion became not only separable but also co-ordinable one with the other. That lens, however, only focused on the 'middle' of the field of vision: not on the microscopic or telescopic ultimates. At these extremities, where the Newtonian concept was unable to produce satisfactory co-ordination, matter and motion still remained confused. Later, and also within the 'middle' field of vision, Clerk Maxwell and Faraday, as it were, added 'binocular' vision to the original 'lens' of the Newtonian concept.

But recently, through the relativity concepts of Einstein and

the quantum concepts of Planck and others, the field of clear definition has been extended towards the telescopic and microscopic ultimates, so that matter and motion are now satisfactorily co-ordinable over a further field of fact.

A concept in the hands of the scientist *being a device whereby he can secure analysable records,* is essentially utilitarian. Thus 'Is the concept true?' is not pertinent. 'Is the concept useful?' – that is a pertinent question; is in fact the only rational question. Experiment can check the concept's utility, test whether it is valid or invalid; the testing of validity or utility being of the very methodology of science.

In introducing this new concept the need will arise to establish a further co-ordinate in addition to the two ascribed to matter and to motion. This third, or *functional co-ordinate,* will not only demand its own technique for 'measurement' within that co-ordinate, but as we shall see, will also need a mathematic whereby data appearing on the functional co-ordinate may be co-related ultimately with those referable to matter and to motion. But such a demand is always present in the history of scientific progress: as, for example, the dependence of the mechanical sciences on the calculus, the theory of differential equations, and the theory of tensors, to name but a few major achievements in the mathematical field.

Hitherto, in studying biological entities, though it may not have been explicitly stated, biologists – content with a particulate conception of livingness – have been concerned with the classification and cataloguing of the great variety of characteristics exhibited by an even greater variety of living entities. The only thread that has held all this together – and that has been broken, knotted and re-knotted many times – is the thread of the theory of evolution. Thus biology, until quite recently having been largely in the preliminary stage of recording and sorting, is only now becoming a science in its own right. In that early phase it led to little power of human manipulation, i.e. of invention. Having disclosed few if any laws of a scientific nature to obey, inevitably there followed few practical inventions: for such inventions are the fruits of obedience to natural law.

The last few decades have shown signs of a coming change. The application of the regularities of physical science to mat-

erial drawn from living sources, has amply demonstrated wide and far-reaching possibilities.

These new approaches and possibilities are now in turn themselves demonstrating the need for a shift in the outlook of the biologist; and are disclosing the need for some new factor orientating the use of the spate of knowledge deriving from newer methods. Moreover, the necessity of examining many phenomena associated with living which hitherto were considered as beyond the pale of science, is also calling for reorientation of thought. Added to this, the rapid changes in the theory, scope and methods of physical science, in particular those deriving from the theory of quantum mechanics, are not without their reflection upon biological science. Change is imminent.

What seems to be urgently needed is some basic concept that will bring the many new and as yet unrelated facts and experiences into a comprehensive framework without producing thereby a logical friction that sets that framework on fire.

The concept – just such a possible framework – that we here submit, reads that 'the environment is as living as the organism it contains'. Or stated another way, that 'livingness' is a 'universal'.

Within this concept, we no longer see a passive 'dead' environment and within it a collection of scattered entities manifesting livingness. We see the flow and flux of livingness universally distributed and see entities, for example amoeba or man, glowing in the lifelight like motes gleaming in a sunbeam. The effect is that, viewed through this concept, we are faced with 'action-currents' flowing in or through a 'medium' of their own: in, out, and about operative materio-dynamic entities, about bodies of every variety and sort, motionful or motionless, the environment behaving the while as if it were living. Both organism and environment are thus seen as engaged, each according to its kind, in what might be described as an overall and mutual process.

Take, for example, a particle or a pollen grain dropped on a membrane of any animal's body. It is drawn into the tissues of that body, where it is engulfed and digested by a wandering leucocyte, so adding its quota to the body metabolism. This is no different in essence from the process that can be seen in the

environment when a petal or a leaf from a tree falls on the ground, whence the earthworm drags it down into the earth there to digest and remove it, and in doing so provides essential nutriment for the society of the soil population. Both the body of the living entity and the 'body' of the environment are recipients of the respective digest, each entity changing the material in a manner specific to its kind before its incorporation into new life. As there is a metabolism of the body of any living entity, so there is a 'metabolism' of the body of the environment: each takes and each gives, and what is given and received in each case is of a specific nature.

The *mutual synthesis* of organism and environment finds its formal expression not only in the biological entities and organisms, components of the cosmos, but also in the disposition of cosmos itself. Hence we come to envisage cosmos acting as 'organism – one organic Whole.

To this there is a corollary. An essential and basic difference distinguishes the biological entities, components of the organism they inhabit, from the cosmic organism; for while the former have both an exogenous (external) and an endogenous (internal) environment, the latter can but be all inclusive. In the biological entities activation may thus be either exogenous or endogenous; that is to say, it may arise from the external or from the internal environment. As we shall see, they can be subjectively urged, or objectively attracted towards synthesis. In contrast to this, all action of the cosmic organism, self-contained and self-originating, must be subjectively motivated. The significance of this difference will only appear as we proceed; as maybe will the reconciliation of two seemingly opposed sources of motivation in organism.

This concept of cosmos as organismal at once opens up a field of new possibilities. One, for instance, is that the great philosophic theory of evolution becomes a 'process' – that of the growth and differentiation of the cosmic organism. Hence, viewed through the concept, man as a species becomes but one of the anatomical features, or differentiated and differentiating 'organs', of a greater organism: and as such potentially capable of a specific function of that greater organism.

What we have done here is to take this concept and give it a

setting and a polish so that it can be used as a lens – as Leuwenhoek did with a piece of glass in making the first microscope. In our own experience the use of the concept has brought enlightenment; it has opened up practical possibilities hitherto unforeseen.

It is, however, but a concept.

The hypothesis presented here as a basis for experimentation into the nature of living, is to be read throughout in the light of the concept that cosmos is organismal. So let us turn to its use; put it as an instrument in our eye and view the field of vision. It is, of course, not as easy as all that. As with most devices and instruments, practice in use is essential and it turns out that in practice this device is unusually difficult to use.

We are, as it were, going to play a new game, so the referee's whistle will be very busy until we are more familiar with the correct procedure: perhaps we shall be forgiven if we present a somewhat disjointed narrative. There may also appear in the course of the narrative a certain simplicity – even comparable to the solemn naivety of learned philosophers dropping feathers from leaning towers. The criticism may well be that we are taking a great deal for granted at the outset of the study. That will depend entirely upon what *use* is to be made of the conceptual device, and in any case it will be better judged at the end of the thesis when there may have accumulated a picture giving the concept a value in practical affairs.

For the time being, let us look upon this biological concept as a sort of *bioscope*. It is a different instrument, with a different range of observation from the physiologist's viewing instrument – which might in comparison be called a 'physioscope'. This 'bioscope' being a new instrument, its lenses are mechanically imperfect and as yet without delicacy of focus, so it is liable to present us with aberrations and interferences that will ultimately have to be overcome. With these we shall have to familiarise ourselves so as to allow for errors.

There are difficulties inherent in using almost any form of optical aid; for instance, the unpractised student using a monocular microscope has to learn to discount all that is seen by the inoperative eye. In using our conceptual bioscope we have to

discount two 'visions' – the everyday outside vision and the inside *recollected* vision of what we are looking at – with both of which we have been bred. These views will keep obtruding on the view seen through the bioscope. So we shall be very apt to forget that we are looking through the 'instrument' and seek to find a thousand explanations prompted by one or other of the accustomed 'views' which must be disregarded in order to see what we are trying to look at. The tendency merely to refer what is seen to the familiar and leave it at that, is a means of minimising the shock of that which is unfamiliar. So we must warn the reader that what he is about to look at, he is unlikely to have seen before.

In the use of our bioscope we have to proceed to our observations with the same care and circumspection that physicists and physiologists give to their procedure. Hence it will be necessary to use the instrument on proper material, properly selected, properly mounted for examination in a correct medium, so ensuring that the material to be examined will be in a suitable state for examination by the particular instrument in use.

The Pioneer Health Centre at Peckham was an effort to secure just such material, suitably mounted, in a correct medium for proper examination with the use of the bioscope, with a view to conducting an experimental study into the nature of health.[1]

If, in setting out on such an investigation, we had taken no care in the selection and preparation of material to be examined, but arming ourselves with the bioscope had marched into the open street, we might have been disappointed in that little or nothing could be seen of any significance. Or again, if we had walked into a doctor's surgery or into a hospital our field of view, except perhaps for a doctor or a nurse here or there, would have looked as dead as mutton. Or on the other hand, had we walked into a group of children playing, the field of view might have been crowded with so much activity as to defeat any effort at discriminate observation.

As with any other technical instrument, there are two essentials: first, the selection of material proper to the intended

[1] see (a) *The Peckham Experiment.* Pearse and Crocker. Chapter III 'Basic Technology', pp. 40-9; and (b) *Biologist in Search of Material,* section I, pp. 33-41.

investigation; and second, the preparation of that material in 'visible' form. Many an uninstructed or clumsy student fails to see what he is looking for through his microscope, because his preparation of his 'slide' has been faulty. That does not mean that the significant items are not there to be seen. Many an experimenter – particularly enquiring into the nature of health – has lost all bearings and wasted his time because in the first place he has not begun by realising the need to make careful selection of the material to be examined. He has assumed the 'normal'[1] to be the 'healthy' and so lost his way in the maze.

For the time being, then, we will accept the concept and proceed with our examination of the *living-organism-in-its-environment*.

[1] Appendix 6.

III

# 'Function'

The world, as science sees it, is machine-like: an operative world. Let us first, then, give our attention to a machine and, with the bioscope in the eye, see how far the performance of any living entity may be found to differ, if at all, from that of a pure materio-dynamic mechanism.

One of the most familiar and yet pure examples of a machine would be a motor car. Set the motor car running at speed, clutch and gear engaged in accordance with its construction, in such a way that it obeys none but its own self-contained laws of materio-dynamics, its operation being recordable in the two co-ordinates of matter and motion. The machine runs amok.

Now put a driver in the car. It runs amok no longer. The machine, with the introduction of 'livingness', does more than merely *operate;* it now *functions*. What then has changed? Not the materio-dynamic operations of the machine, nor of its engine; they continue to move in sequence according to the materio-dynamic laws underlying their construction whether running 'alone' or under the direction of a conductor of function – a 'functionary' – in this case the driver.

Whereas every machine, even the cosmic machine, operates through a systematisation of sequences, a functionary gives something to the action which does not pertain to the sequences of the machine: gives it a pattern of order.

It is not possible at this stage to do more than state that, seen through the conceptual bioscope, order and system are neither identical, nor related, however closely they may be co-ordinated. The regularities, or laws, of the physical world seem to be irrevocably linked with system and with sequence; in the

biological world they seem also to be linked with a pattern of order, pattern in this case being to biological order as sequence is to materio-dynamic system.[1] Perhaps for the first time we are realising that system and order differ in essence. They belong to different co-ordinates. While system pertains wholly to materio-dynamics, order does not appear on the materio-dynamic co-ordinates. It pertains to the third, or functional co-ordinate.

Could we have seen this without the bioscope? No, for without it we regard man as a superior being set above and apart from the machine – the view we are accustomed to take of him. Only with the bioscope do we see him involved in mechanism both as functionary and as a 'man'. But the 'man' now has ceased to be a dispensator; as functionary he has become a medium of conduction, a 'conductor' – or it might be, an 'inductor' – of function.

The immediate, nay imperative, temptation is to discard the bioscope and begin to explain; for the mind's eye is full of experience of men and of motor cars which after all are designed for men to drive. The illustration is certainly a crude one, but its very crudity draws the admission that there is here something that needs looking at. That 'something' is the fact that there is a difference between operative turnover to be seen in the car itself, and functional action involving that car – a difference that we tend to ignore for what are called practical purposes. Since, however, we are playing a game, practical purposes have for the moment little significance. So we may go on with the game and again glue the bioscope into our eye.

It might at once be said that, had we chosen a monkey, the machine would have included the monkey in the disaster. That is, of course, correct: the bioscope would not reveal the monkey as a functionary, an inductor of function, in the illustration chosen. But that does not detract from the value of the illustration, for all it indicates, as seen through the bioscope, is that the motor car did not fall within the functional capacity of the monkey. A monkey is not that kind of conductor: any more for that matter than would be any human non-driver in the driving seat.

The illustration further implies, and this is important, that

[1] Appendix 7.

the simplest, easiest and most obvious approach to the study of function is the species *man* exhibiting his full potentiality. For, although man has reached so complex a degree of constructional development, nevertheless owing to the highly discriminate and discretionate nature of his actions, he in fact represents the very *acme of functional 'simplicity'*. To take one illustration: while amoeba brings its whole body into action in order to seize and engulf a particle of food, man has but to stretch out a finger and thumb, or may even invent an appropriate implement with which he can do so with even greater finesse. Thus, owing to the complexity of his structural development correlated with a very high discrimination in action, man's behaviour can indicate biological function to a nicety impossible in less highly evolved species.

Now strangely enough, this discovery that man is the field of election for the biological study of living – particularly for the beginning of that study – is an important discovery, or 'invention', which has grown out of the use of our concept; a first evidence of its utility. Hitherto the biologist, following the lead of the physiologist, student of the mechanism or machinery of organism, has been led by the very obvious constructional or anatomical simplicity of the so-called 'simple' cell and unicellular organism, into accepting these as the simplest forms for his purpose. The warning that might have been gathered from the fact that the physiologist emphatically insists upon the universality of the simple cell (it is called a 'microcosm'), has gone unheeded.

If, then, we are to study function, we should be well-advised to begin with man rather than with less differentiated species. Thus the student of function or living is, from the outset, forced from the cellular field into the human field, forced to discard the lower for the higher animal.

It may seem arbitrary to usurp the word function and give it so special and precise a significance. The excuses for this are two. The first is that had the word function had a precise meaning, its usurpation for this purpose would have been impossible. The second is that in all cases where the word function is commonly used – *other than in the present sense* – we find other words already used interchangeably, such for example

as 'operate', 'work'. Thus what is proposed and only for the purposes of this text, is to continue to give both to the word 'function' and to the word 'operate' restricted and considered significance.

If you start the engine of any motor car you – listening – may say 'it's functioning', meaning that it operates or works correctly. According to our use of the word, it will only begin to function when you get into the driving seat and take the wheel. But even then we are not concerned with what is done with the motor car: whether it is used for a weekend trip or for delivering the coal. Nor does it matter whether you take the longest or the shortest route to your destination; though all these latter are, of course, quantitative factors concerned with the efficiency of the machine. They pertain to the materio-dynamic co-ordinates; not to the functional co-ordinate.

Function, or functioning, then, does not *do* things, nor cause the machine to 'do things'; for instance to turn out more 'goods'; i.e. it is not *productive* in the ordinary sense of the word. Function is not a new aspect of energy as recognised by the physicist, nor is it a new consequence of a passivity of matter deflecting or reflecting energy in a new way. Function is concerned not with *what* is done but with *how* it is done. In the instance of the motor car, whether with or without a driver, what it does is analysable in terms of materio-dynamic laws. Not so 'how' it is driven: with the introduction of a driver the car behaves in a new way – though continuing to obey materio-dynamic laws. It is this new factor which for the moment we call the 'how'.

Any piece of the machinery of the body, or even the body as a whole, *can* operate without functioning. The famous heart of Alexis Carrel, isolated in a bottle where it continued to beat and renew its tissues for twenty-five years, was operating: it was not functioning. The vehicle that carriages life is not necessarily living, any more than is the car that carriages the functionary. The view seen through the bioscope will tell us whether we are looking merely at materio-dynamic operation or at functional action which involves both materio-dynamic operation and function.

Things, situations and events are seen through the bioscope

as yielding a tri-partite tracing on three separate co-ordinates: a material, a dynamic and a functional. In adding the functional it is as though we had added colour to the black and white record of materio-dynamic operations. The use of this third co-ordinate does not cancel out the other two co-ordinates, those of matter and of motion: it merely provides us with a third aspect of things, situations and events to be accounted for in living.

In order to understand functional existence attention must not, of course, be given exclusively to this new functional co-ordinate. It is, in fact, not a new world or universe that we are seeking to discover: only a deeper understanding of the world of which we are already aware. It is rather that some special feature of the old universe recognised by the physicist – but as yet unexplained – now comes prominently into view, seen on a new co-ordinate.

But by adding this third co-ordinate, we are at once presented with a new problem; the correlation of all three co-ordinates. That, in fact, is one of the objects of the study in which we are here engaged and to which we shall return later in this treatise.

Function, seen through the conceptual bioscope, is neither *causal* nor *effective* – the causal effectives belong to the physiologist and to the physicist. Rather is it that, while the machine is only capable of operating sequentially and systematically, function has a peculiar potency of its own which gives a patterned order to the sequences of the machine – whether the 'machine' be man's own body mechanism, or a motor car. Function has no quantitative significance whatever. It is purely *qualitative.*

Unfortunately there is a world of confusion about the terms 'quality' and 'quantity'. The confusion arises out of the frequent necessity of distinguishing between material quantities and dynamic quantities which are different. The term quality is too often used when what is meant is dynamic quantity. In no circumstances should quality imply quantity; for quality, we submit, has a reality of its own – as may be seen by the time we reach the end of this thesis.

*It is naturally a very serious difficulty that quality cannot at the moment be defined or measured in any positive fashion, but merely*

*recognised as something quite distinct from quantity: as something pertaining to the functional co-ordinate, and not to either the material or dynamic co-ordinates.*[1]

For the time being, then, we can only refer to quality by analogy using the terms of reference of quantity. To be forced in the initial stages of investigation to proceed by analogy is, however, no new procedure in science.

It is necessary to realise at the outset the very great difficulty in the initial approach to quality, and to keep in mind the distinction between quantity and quality because, when we come to the question of 'measurement', we shall have to keep each strictly within the range of their respective co-ordinates. Just as length is used to measure length, movement to measure movement (e.g. periodicity or quantitative repetition to measure sequences), so some functional yardstick will be needed to measure functional action – 'measure' meaning here assessment and formal recording.

Quality seemingly does have a means of disclosing itself, for functional action does inscribe its own manuscript. It is to be seen in *action-patterns,* to which subject we must now turn our attention.

[1] Appendix 8.

IV

# Action-Patterns

Action-patterns are the 'manuscripts' of functional action. Perhaps the best known are those to be found in the notorious 'finger-prints' which provide but one of the now growing number of registers of the unique, or *specific*, nature of every living individual. Finger-prints are not, of course, the registers in most common use; not the most obvious ones. Our recognition of our friend John Smith is equally the realisation of the uniqueness, the 'specificity', as it should be called, of John Smith: a picture of his functional action-pattern. It is the same 'specificity' that allows the dog unerringly to find its master in a crowd, whatever faculty may be employed in appreciating that specificity. Action-patterns, or functional records, are not 'impressed' only on substance, i.e. they are not only in some way associated with the material co-ordinate, as in the case of his finger-prints, or of John Smith's physical features – by which we are apt to assume we know him. The dynamic co-ordinate also takes the imprint we recognise in John Smith's bearing, posture, movement, so peculiar to him. The outstanding characteristic of his action-pattern is, however, the uniqueness of John Smith himself – a factor which, as we shall see, is impressed upon the functional co-ordinate.

This uniqueness, or specificity, of an individual, is all-pervasive. The specificity of a Rodin is recognisable in a lump of stone; that of the long dead Rubens within a picture frame; that of Beethoven in a sonata, even when interpreted in some equally unique and recognisable action-pattern; that of the executant overlying but not confusing a recognition of Beethoven.

Or to take an example from experience: I was once walking along a playing field on the outside of a tall solid paling which did not meet the ground by twelve inches, and behind which there were some three hundred schoolgirls whose feet only, in their standard shoes and stockings, showed beneath the palings. The games mistress who was with me interrupted our conversation with 'Oh! I must speak to Joyce.' She stooped and touched a heel – a confusion on the other side of the paling – a face peeped beneath and Joyce got her instructions. In the posture of a pair of ankles was carried the action-pattern of a whole individual.

Or again, sitting in a railway signal box on a dark night, in the far distance from several miles away came the rumble of the express train from London. 'Hallo' said my friend the signalman. 'Forsyth's driving her – wonder what's happened to Courtney?' Next morning, on enquiry of the stationmaster at the junction, I found it was true. Courtney had been taken ill suddenly and Forsyth had deputised for him – all unknown, of course, to the signalman who in any case had met neither Forsyth, nor Courtney. He knew them only as names on paper and by their 'action-pattern' impressed on a dynamic medium – a unique action-pattern transmitted through the rumble of an unseen train. Or, in a listening post with nothing visible in the sky, said the listener: 'That's "Lizzie", and Crompton's flying her.' 'Lizzie' an aeroplane, and her pilot imprinting his action-pattern on her course.

But within every man's experience there must have been encountered action-patterns of a specificity of this order. We may seem to be making a mystery out of a commonplace; but it must be recalled that we are looking at things with a 'bioscope' screwed in our eye and it is only then that these action-patterns assume special significance. It is by action-patterns that we see uniqueness as a quality of the living entity: that is to say, that we are able to distinguish between operation and function.

Just as in the story, the commonplace fall of an apple gave record of the action of gravity, so – using the concept – these action-patterns, seen through the bioscope, become the records of *quality* in action, thus serving to illuminate the characteristic of *function.*

A more technical use of action-pattern will be seen further to illustrate this. In order to distinguish the nature of a micro-organism, the bacteriologist has frequently to determine the presence or absence of motility in a bacterium. The bacterium will be found amidst a suspension of moving particles. Looking through the microscope, the motility of the bacterium will exhibit an 'action-pattern' which will stand out with a peculiar and special significance against the 'operational' tracing of the Brownian movement of the particles in which the bacterium is suspended. The bacterium shows an 'action-pattern' of 'order' seen against the particles which, in their Brownian movement, show a tracing of the sequences of 'system'. It is by this action-pattern that the identity of the particular bacterium is established.

An example of a still more frequent, though highly critical technical use of the functional action-pattern, is provided by the histo-pathologist in arriving at the differential diagnosis between benign and malignant tissue as in the case of cancer. A cell, ignoring the body of its inhabitation, and initiating and sustaining its (personal) identity in isolation, may become malignant, cancerous: in which case the action-pattern of order of the tissue concerned will disappear and be replaced by the tracing of rigid sequences of disorder. The diagnosis in this case depends upon the histologist's familiarity with the picture of functional action of the tissues under examination. This is generally considered to be a most unsatisfactory state of affairs because only here and there and only among the few, is this skill – the recognition of the action-pattern of a tissue in health – exhibited to a nicety. Thus we find that laboratory workers are struggling to provide a diagnostic characteristic for cancer which is not in the functional field but in the materio-dynamic field; some test that can be performed in the laboratory test-tube and be seen 'objectively' by any and every eye without understanding or art. In fact what is being sought in the diagnosis of cancer is a quantitative test in contra-distinction to the present test, which is essentially 'qualitative'.

It may seem a far cry from a finger-print to cancer. Yet these illustrations serve to indicate the pervasive nature of function as an *ordering* agency which makes its own specific imprints – its

unique action-patterns. Any cell may, of course, retreat from the full implication of a functional relationship with the body it inhabits, and by encystment, pass into a condition of 'survival' in which case its distinctive 'action-pattern' of function will fade into an operational tracing – like any machine 'ticking over'.

Changes in the action-pattern of an individual are heralds of change in his state of existence – 'living', 'surviving' or dying – i.e. from functional action to the suspended action of compensation or to the re-action of disease; or vice versa. Their recognition can be of deep clinical significance.

Just as in proper conditions the bacteriologist views the motile bacteria, so the biologist in suitable circumstances may view a number of youths in the free use (i.e. without supervision) of a gymnasium filled with a wide variety of apparatus. Some of the youths move with distinctive action-pattern, like motile bacteria. Others give an operational tracing, like the particles showing merely Brownian movement.

Or, an individual in a playground or dance hall may, in the same way, be seen moving either with functional action-pattern or with operational tracing, thus yielding evidence as to whether or not he is moving functionally.

'Action-pattern', perceived in the orientation of the entity in relation to the body of its inhabitation, is a record of order. The quality to be seen in action-pattern is an attribute of order: it is not found in the sequences of system. Action-patterns are to be appreciated subjectively. But as we have already seen, subjective phenomena cannot be ignored by the biologist.

The problem before the student of living, is to find methods of securing permanent records of quality. It is the conditions for observing, the means of measuring, and the methods of recording action-pattern that have to be found for the assessment of function. Before that can be considered, however, it will be necessary to look for and if possible to find out how these action-patterns are imprinted, and with what and in what medium they are imprinted. Without some answer to these questions it will not be possible to devise means of securing records in experimental conditions.

It might be asked, why must we introduce here a new word, action-pattern, when there already exists the word 'behaviour'

as a technical biological entity? 'Behaviour' is referable to the operation of the organic mechanism in whatever mode the organism may be existing; or to whatever conditions it may experimentally be exposed. 'Action-pattern', as we shall see later, arises in conditions other than those envisaged, or demanded, in the assessment of behaviour. It is into these conditions we here propose to enquire.

First, then, we must ask: how are action-patterns made? To discover this we must return to our definition of health.

V

# Mutual Synthesis

## Two Types of Synthesis

The definition we have given states that health, or functional existence, depends upon a faculty of the organism for *mutual synthesis* with the environment.[1]

The word 'synthesis' tends nowadays to have a restricted technical connotation: 'synthetic' dyes, 'synthetic' silk, etc. It may even carry with it the implication of artificiality. In this thesis the word will be used in its original fashion: synthesis, a building-up process; not merely the random stacking of brick upon brick, but a building-up either to fit a preconceived framework – that is, with *objective* specificity – a resurrection; or a process by which the plant or organism builds up (i.e. grows) to the pattern of its own potentialities – that is, with *subjective* specificity – a 'birth', or creation.

Therein lies the difference between the products of nature and laboratory copies of these products. Both are 'synthetic': they differ in being either something born of the living, or something raised from the dead. Thus in this book, the word 'synthesis' has no implication of artificiality or substitution, which it is apt to have in common parlance.

Nevertheless, there was a fundamental reason, seemingly intuitive, for drawing a distinction between laboratory, i.e. objective specific synthesis, and the so-called 'natural' or subjective specific synthesis. The distinction lies in the antithesis between *quantitative* identity and *qualititave* identity. That, however, would seem to take us nowhere, for there is as yet no known means of assessing or of measuring quality.

[1] Chapter II, p. 23.

We must, therefore, pursue the search for definition of this distinction.

The laboratory products of objective synthesis are like a house fully equipped and furnished by an architect or a firm of decorators, which is an objective synthesis as opposed to the subjective specific 'home' grown of parental synthesis. In a home, the same quantitative aggregate is translated into something different by the subjective action of the family. The distinction here clearly does not lie in the quantitation involved – that may be the same in either case. It lies in the *pattern* of those quantities as they assemble. This pattern we have already seen to be associated with functional action and to be a characteristic of quality.

The difference is not a subtle distinction of no moment: it represents a fundamental *antithesis* between the constructs of operative procedure and those of functional action. It is not difficult to see at least one reason for that being so, for to achieve an objective synthesis a determinative judgment has to be exercised on a storehouse or shopwindow of already analysed material available for attaining the given goal, or purpose. But since no differentiation occurs in the process of analysis, the result of synthesis from analysates can only be additive, sequential: in fact, the repetition of previous synthesis. So though there is change in the quantitations involved in objective synthesis, there is no change in specific diversification in the resulting construct: no change in quality.

No refinement of quantitative technique will give quality to a thing, situation or event: that can only arise out of functional action. Neither the architect, nor the firm of decorators, is the functionary[1] in the house, for unless it is his own home, he is in the same relation to it as the 'monkey' or non-driver in the motor-car. Nor, indeed, is a functionary just any user: he is one who in his use of the tool involves that tool in something more than the attainment of a goal set by a determinative purpose. A functionary, as he moves from sythesis to synthesis, incorporates the 'operative' power of the tool in a new synthesis of a subjective order. This we shall see as we proceed.

Still further to point the distinction between these categories

[1] Chapter III.

of synthesis, it is too often found that the product of objective synthesis seriously interferes with subjective synthesis, so lacking in quality, so functionally inert, may the former be. Nothing, not even exuberant health for instance, enables any social unit or group of society to synthesise 'community' out of edict, ordinance or law, any more than it will allow community to spring out of some housing estates planned with that purpose in view. The very completion of objective synthesis in the rigidity of its form and structure, can debar the emergence of any subjective synthesis in those circumstances.

Nevertheless, the fact is that objective synthesis, being deliberate, is obvious and readily appreciable, while wherever functional action is in process action is so smooth, so natural, that it passes unnoted and is taken for granted. So it is understandable that the potentiality for subjective synthesis is easily overlooked; or ignored.

Perhaps that is why the opportunity for subjective synthesis but rarely enters into contemporary 'planning' activities. After the 1914 – 1918 war the nations were continuously exhorted to beat their swords into ploughshares. It took many years, and a second world war, to apprehend that even the ploughshares of 'peace' can run amok, bleeding whole continents white with their ugly wounds, if they are used to conquer and to exploit the fertility of the earth. It took time and the disaster of the dustbowl to show that virtue does not lie merely in the mechanically efficient operation of a tool. It lies in the functional use of an efficient tool.

The potentiality for subjective synthesis is equally unappreciated in the sphere of social action. Where the family is concerned – apart from the procreation of children – even the possibility of subjective synthesis is ignored by every type of specialist concerned with the administration of human affairs. Though it has become customary to pay lip-service to the 'importance' of the family, in practice the basis of approach in all our institutions, political, educational, social and therapeutic, is analytical; to and through each individual, severally. Any final gathering together of these several approaches in deference to a theoretical evaluation of the 'family' can again but yield an objective synthesis.

We must keep in mind that here we are setting out with a new conceptual bioscope in the eye. Its dispersive power extends the field of vision over three co-ordinates: the material, the dynamic and the functional, on all three of which synthesis stands out in high relief. But while objective synthesis can be recorded on the materio-dynamic co-ordinates alone, subjective synthesis – with which we are here concerned – can only be understood by use of all three co-ordinates.

On the materio-dynamic co-ordinates, we see synthesis issuing in multiplicity and repetition in infinite variety of combination and sequence. In organism, these appear as sustenance and maintenance, both of which can be carried on with, or *without,* the implication of functional action. This, laboratory experimentation has made abundantly clear. On the materio-dynamic co-ordinates, production – which can be read in terms of the pure economy of materio-dynamics – should balance with consumption. But in the living organism that is a tightrope no acrobat has yet walked; every assay so far has spelt disaster. Possibly it may continue to do so until the distinction between objective and subjective synthesis is fully appreciated.

On the functional co-ordinate, we see syuthesis issuing in specific diversification, which in general terms is recognisable in the originality of growth and differentiation. Bionomic economy, the economy of quality, is unknown, unexplored. For instance, certain phenomena called 'adaptations' by the biologist, whereby insusceptibility arises or other characteristics may be 'acquired', are treated as *sporadic incidents,* whereas they may turn out to be conspicuous examples of the subjective synthesis of functional action.

In natural conditions, subjective synthesis is so commonplace an occurrence as to escape notice – except by the poet or aesthete. Yet its exuberance is staggering in its immensity – and nothing stops it. In any one season there is the renewal of the various tissues of the tree. That in itself is a mighty performance. A specific identity stamp of each particular season is woven into the tree's new substance; a record of that year's action-pattern; its 'finger-prints'. Every vicissitude is registered. From the immensity of the exuberance of this rhythmic recurring synthesis we find an extravagant storehouse in bark, leaf, blossom, nectar,

pollen, ovary. Still further, as the very acme of this subjective synthesis, there is presented year by year, in each of its many-seeded fruits, a multitude of *new* trees (i.e. original specific diversifications of that tree) each one stamped with the unique functional action-pattern of a new and unique living entity. Every step in the process is individual, unique; each and all marked with the impress of specific diversification: with quality.

In the human organism – the family – the rhythm is more obscure. But here also there is the seasonal renewal of the total substance of the whole organism, the specificity of the season's identity woven into the body of each individual of that family as a permanent record of that season's action-pattern; every vicissitude is again registered. The anewal of the subjective synthesis is as extravagantly exuberant as with the tree. Its 'bark' (man's hair, nails, skin, etc.), its 'leaf' (man's work, his goods, ploughshares, warships, aeroplanes, bombs), shed as extravagantly as the leaves of the tree; its blossom (perhaps man's art) – and no doubt nectar too. Add to this that acme of synthetic exuberance, the children, and beyond that the 'seeded fruits', that is to say the new mated pairs, or new 'families'. The cycle is complete; growth and differentiation of specific diversity – synthesis in excelsis.[1]

When looked at through the bioscope, this process of subjective synthesis recognisable in such biological entities as man and tree, is seen to spread throughout the whole field of view. Its impress pervades the environment; soil, plant, insect, animal life, the very climate: all are involved – and to an extent of which man, as yet, has but little conception and less knowledge. It dominates not only the organism and its immediate environment, but ranges throughout the *total environment:* translation and transformation in everlasting procession of subjective synthesis.

We are faced with no less than the study of the whole, as well as of its 'parts' – with, so to speak, the 'bark, leaf, bloom, nectar and seeded fruit' of a *cosmic organism;* and with the process of specific diversification in the uniqueness of growth and differentiation of that 'organism'.

[1] Appendix 9.

## Specific Diversification

When subjective specific synthesis is occurring in functional action there arises anew in every thing, situation and event, a uniqueness of specificity of its own; something original, some specific diversification of individuality: new quality. We recognise this in the fact that each cell in a body, each individual in a family, or each organism in its environment, is itself unique – a specific diversity – and is other than its neighbour in virtue of its quality.

Here there is a process throughout which the specificity of the parts engaged, while retaining their own uniqueness, furthers both the specificity of themselves and of the specific whole they inhabit. This is the process which distinguishes bionomic growth and differentiation from mere operation of mechanism.[1]

So it becomes clear that biological entities are not individualistic merely in virtue of no two of them being able to occupy the same place in space, nor the same event in time. Bionomic individuality is more than can be accounted for in Space-Time relativity. *In so far as this is so, the living cell, individual or organism passes beyond the field of possible inter-se comparison and contrast* – the basis of all measurement in the Space-Time dimension.

How closely and intimately the qualitative attribute, specific diversification, is to be co-ordinated with quantitative events has yet to be studied. It is obvious that 'specific diversification' as a quality is not so simple to co-ordinate with quantity as may be, for instance, colour qualities with wave-lengths of the spectrum. At this stage we cannot even press the analogy between 'colour' and 'specific diversification' into the value of a homologue; for we need to know much more about the nature of quality. Nor can we lift the burden from the epigastrium of understanding by heaving a 'psychological' sigh; it is digestion rather than regurgitation that has to be achieved.

The issue before us is a practical one. What are we to look for: how distinguish subjective from objective specific synthesis?

At the outset, account must be taken of the fact that man, the observer, being himself so deeply engaged in all his doings in

[1] Appendix 10.

the accomplishment of objective specific synthesis, is apt not to 'see', or knowing, deliberately to ignore that which he cannot manipulate and measure. So in investigating the process of subjective synthesis, it must be anticipated that search has to be made for what hitherto we have *not* seen and have not acknowledged.

## Mutuality

Any and every biological entity – but *only* in the *field of functional action* – is participatory in the same synthetic process as that engaging the environment, i.e. the inhabitation, or functioning whole of which that biological entity is a part. In this process of synthesis, we see all biological entities – the cells of our bodies, for instance – each in mutual participation with the body they inhabit. It is this mutuality of participation in synthesis which emerges in the specific diversification of themselves and of that body. The outcome is growth and differentiation.

In this biological process, the characteristic feature is that the synthetic action proceeds without loss of individuality either of the part or of the whole. The one is not robbed by the advancement of the other. On the contrary, both 'gain', but the 'gain' is in specific diversification: that is, in further individualisation. In the unity of action, whether of cell and body or of organism and environment, it is *mutuality* within the inhabitation which 'subjectivates' the synthetic process. Mutuality of synthesis has, then, to do with the organism *and* its environment. It is an attribute of wholeness.

So, for example, it is not as is commonly supposed, that the human organism has to use its power of synthesis *on* its environment, objectively 'conquering nature'; 'fighting' the manifold threats of the environment. Nor is it – again as is commonly supposed – that the environment is perforce exercising the power of synthesis *on* the organism, objectively 'subjugating' man, any more than man subjugates the cells of his own body. Nor again is the cell or organism an egocentric entity which, by compromise or other inhibition, has to secure for itself a place in a congregation of its fellows. In no way is the living entity called upon to 'sacrifice' any portion of its individuality

'for the good' of the whole. On the contrary, we have to treat with 'individualities' within 'individualities', all specific in their diversity, each maintaining and furthering its own uniqueness in the mutuality of action of subjective specific synthesis within the whole.

Emphatically the significant difference between objective specific synthesis and subjective specific synthesis is not a quantitative one. In subjective specific synthesis there is no factor limiting the operation of the machine. The machine continues according to its own laws where and whenever it is in operation. The difference is to be seen in another realm. It lies in the patterns of order that are engaged in and emerge from the action. Its evidence is to be seen in change in quality.

We have already seen that system and order belong to different co-ordinates.[1] The order that this change in pattern represents does not appear on the materio-dynamic co-ordinates. The uniqueness of the pattern – though materialised (as, for instance, in 'finger-prints' or in the annual rings on the trunk of the tree) – arises, as we shall see later, from circumstances which are different from those of the sequences of materio-dynamic system. Growth and differentiation do not arise merely from *what* is done, but from *how* it is done. Both materio-dynamic system and biological order are involved in their procession.

So it follows that the functional significance of, say, the tree cannot be gauged merely by the measure of its productivity. Functional action can only be recognised in the action-pattern traced by the tree in its *mutual excursion with the environment:* i.e. by its influence or impress on what must be called the 'total situation' of the inhabitation. Sheep grow and produce lambs, wool and meat, but in their 'productive' activity they may either ruin – or enhance – the fertility of the pasture. Both are possibilities: which will arise depends on the absence or presence of mutuality in the synthesis in which they are engaged. The functional significance of the cow cannot be gauged by the number of its calves and the quantity of its milk yield, but only by the action-pattern of the cow's mutual excursion with the environment. So with man, his 'productivity' does not present

[1] Chapter III, p. 32.

us with a picture of his functional action, for functional action cannot be gauged by operative products but only by the manner in which these are produced and used by him *and* the environment: again, not merely by *what* is done, but by *how* it is done.

It is, in fact, in the relationship engendered by the mutual synthesis of organism and environment that the true inwardness of the science of ecology is to be discerned. Ecology is the study not merely of the spatial relationships and the related sequences of events that occur on one hand in organism, and on the other hand in environment, but also of the mutuality displayed in their functional action-pattern.

In an age when men are pre-eminently conscious of the integrated operations of the machine and are intently engaged in an objective approach to the contemporary world, it becomes difficult to appreciate even the *possiblity* of action in the mutuality of subjective synthesis. The almost universally unquestioned belief that progress lies in the objective 'control' of men and circumstances by programmes based upon analytical and statistical procedures, makes the sporadic and 'original' happenings of mutual synthesis appear of little account. The mechanist has no place for the 'things which happen once'. On the contrary, they tend to appear as an intrusion, obstructive to his purpose! Such an approach leaves little room for the emergence of an order sustained by its *own inherent ecological equilibrium*. Fear of a loss of control of objective synthesis, moreover, forbids contemplation of such a possibility. So quality drops out of living.

Nevertheless, willy-nilly, in our daily doings and in our free communications with our friends, if not with all our neighbours, we are deeply involved in mutual synthesis. The very 'naturalness' of such free transactions – like the 'ease' of health – leads them to be overlooked and so to go unrecognised for what they are. We could not even walk down Oxford Street without impediment and collision, were it not for the wholly unconscious exercise of mutuality in the functional action of ourselves and our fellow-pedestrians. If as a man says, he momentarily 'forgets' himself – in fact, becomes merely *self*-conscious – he is suddenly, unaccountably as he believes, plunged into the dithering doubt which brings both himself and

the oncoming pedestrian to a standstill: or in avoiding whom, he 'inadvertently' collides with someone else! What is the essential difference between his usual uninterrupted 'ease' of progression and this sudden lapse that leads to collision? It is the difference between mutuality of action within the *total* situation by which he was proceeding in the first instance, and that of moving objectively without mutuality in the immediate contiguity of his *own* situation in the second instance. There is a 'wisdom' in mutuality of action which far out-matches unrequited objectivity.[1] The potency of qualification in achieving natural order through mutuality is incalculable; though as yet man may not either recognise it, nor know how to achieve it.

Another and simpler example of mutuality can be seen in a rider on his horse, where the action-pattern is written in the attainment of a mutualised *unity* of action between horse and rider. It is, perhaps, difficult to realise that though we may not be riding a horse, we are for ever 'in the saddle' of the environment. The only difference, if there be one, is that in this latter case the superior wisdom lies in the 'mount'. This, science has already made abundantly clear in recognising that man's advantage lies in his faithful compliance with the laws of nature.

## The Attributes of Mutuality

1. *Motivation from Unity.* On the face of it, in the all-pervading specific diversification of 'individualities', there would seem to inhere an antithesis in which chaos is implicit. On the contrary, in the living world we are faced not with chaos but with order. How is this antithesis resolved? It is through the mode of motivation in subjective mutual synthesis in which process each cell, individual organism, or species, is motivated by the unity of the whole of which it is a functional inhabitant.

The two entities, organism and environment, like the cell in the body of its inhabitation mutualised in the process of synthesis, act in unity as a *single entity*. It is as if, in unity, they were acting bi-manually in the endogenous invention of a new symbiosis, their action arising from a *single* fount of motivation.

[1] See further discussion of 'voluntary action', Chapter xx.

This mode of motivation from unity is clearly other than motivation of each part severally as seen, for instance, in the synchronous motivation of a multi-cylindered engine. Nevertheless it is this motivation from unity – of whatever whole – which is associated with the ordering of specific 'pattern' in the realm of quality.

When the process of mutual synthesis moves in unity, the range or excursion of, say, the chemical 'awareness' of the cell, pervades the total situation of which it is the inhabitant. Hence such a cell, or entity, might be said to have 'knowledge' of its whole: to be 'at home' in it; to be at 'ease' – 'familiar' – with it. By the use of 'familiar', we imply the position of being within a *field of group-specificity,* such for instance, as the body provides for its own cells; or, as we shall see later,[1] a functioning family-organism provides for its own members, or 'organ parts'. It is within the inhabitation of a qualitative whole – wherein group-specificity forms a familiar environment for each of its myriad inhabitants – that the antithesis in the specific diversity or uniqueness of each individuality can be resolved.

Motivation from the whole endows subjective mutual synthesis with the most spacious excursion in variety – the variety of *all* that whole's diverse inhabitants; so the order that emerges is expansive and differentiating. In this way, we see growth and differentiation, far from being processes of restraint or restriction, as expansive and liberating – through qualification.

Subjective mutual synthesis, which arises from motivation in unity, can neither be understood nor recorded on the materio-dynamic co-ordinates alone; for there, motivation from the whole is not represented, any more than is the pattern of order that arises from that type of motivation. This, of course, does not mean that the *results* of the process cannot be observed in materialisation, as we have already seen in the case of action-patterns which may be recorded in morphological dispositions in the body tissues.[2]

The action-patterns of function by which order is recognisable do not arise out of the immediacy of contiguity of cell with cell, or part with part within the inhabitation, as in

[1] Chapter x, p. 110 et seq. [2] Chapter iv.

materio-dynamic sequence. The action-pattern of function is the record of mutuality in a process that is only to be seen in a total situation. It is the signature of its whole imprinted on the part.

II. *Fields of Unity.* When we consider the functioning cells in the body we find that each cell has its own individuality, its own specificity and 'awareness' of the body; the whole of which it is a part. Each cell, itself an individuality, is, as it were, a nucleus of specificity pervading the field of unity of cell and body. Its own specificity thus tinctures the whole inhabitation. Hence the body, or whole, shares in as many individual specificities as there are cells in that body – though numerically there is but one body.

Now if for the moment we cast aside our numerical and morphological conceptions of cells and the bodies they inhabit, we can then see that from the functional point of view there must be as many 'qualitative bodies', or functional inhabitations, as there are cells in that body. Consequently, there are as many functional wholes each characterised by it own peculiar specific diversity. This can be appreciated readily in the case of persons in their inhabitation, the home, where there are as many functional 'families', i.e., as many qualitative 'fields of unity' as there are individuals in that family.

It is as though each biological entity – each cell, each individuality – were itself a nucleus of specificity pervading the field of unity; that specificity tincturing the whole of the inhabitation. The whole, then, shares in as many individual specificities as there are cells in the body – though numerically there is but one body.

So in the patterned order of quality, we have to conceive of 'wholes upon wholes', each overlapping every other in the inhabitation shared by all. No easy situation to envisage. Still more difficult is it to grasp the specific relationships it engenders.

Again the cell within the body of its inhabitation affords the simplest illustration. Though each cellular individuality is not directly specifically related to any of its neighbour individualities, or cells, all are specifically related in the field of unity of

their whole – the body – of which all the cells are parts. Only *that* whole partakes of the specificity of them all. Hence it follows that the specific relation of one cell individuality or whole, to its neighbour whole, is through the specificity of the body, *the* whole in which all share.

Whilst in materio-dynamic sequence there is a direct 'linear' relationship between the quantitative elements that constitute any materio-dynamic construct, in this field of quality relationship does not hang on contiguity or continuity, but on specificity. There is no *inter-se* relationship between the several entities that go to make a qualitative whole: the specificity of each severally bears relation *only* to *the* whole shared by them all. Hence, in functional action, the specific relatedness of each individuality to its neighbour is through the congenial or group-specificity of the whole field of unity.

Earlier we saw that in functional action motivation is from a single fount. Now we see its source – from the field of unity of the inhabitation of the participants in the synthesis. The significant relationship is not a direct one as between neighbours; it is in a *per-se* relationship of each to the qualitative whole.

It is perhaps easier to grasp the significance of motivation from 'unity' by its absence in any given situation. For instance, a cell in the body, or an individual in a family, can be limited in its functional action by the fact that the body, or the family, is not functioning as a unity. A cell cannot function fully in a non-functioning body that is not in mutual subjective relationship with its own cells, for in that situation it is robbed of the possibility of mutuality in action within that whole.

Again, of two adjacent cells within the same inhabitation, one may function and the other not. But since the functional relationship of the cell is with the body as a 'unity' not reciprocally or integrally with its neighbours, its own function in this case is not necessarily impaired. Pathological process is illuminating in this respect. A non-functioning cell becomes surrounded by a zone of reaction and/or de-differentiation; is sequestered in a *functional* vacuum, so to speak. Cut off from functioning in the whole of its inhabitation, its tendency is to become predatory upon its neighbours – a circumstance

familiar and well-recognised both in cellular and in social pathology. In this circumstance, *dis*-order becomes apparent. That fact would seem heavily to underline the potentiality for order in the body.

III. *Spontaneity*. Objective specific synthesis is drawn from a storehouse of quantities in the assembly of which a determinative and selective judgement has to be exercised to achieve synthesis. Subjective specific synthesis arises in a field of unity engendered by already 'qualified' entities specifically related to each other through their group-specificity. Here supply for synthesis springs into commission in mutuality of utilisation within the totality of the situation. Hence in subjective specific synthesis there is no search for apposite material, no pros and cons of suitability: no need to test and try, for owing to the specificity of the participants, synthesis arises spontaneously and mutually within the field of unity. That which comes is grist to the functional mill – through the subjectivation implicit in mutuality. Time lag is gone: There is no need for 'time to decide'; no need to reorientate the situation it 'solves' itself, issuing in novelty. Nor is there anything automatic, reflex or predetermined in this process.

Hence in the subjective specific synthesis characteristic of functional action both the motivation and the qualification are *spontaneous – throughout the whole;* as though neither Space nor Time played any primary part in originating the novelty in action; as though not quantity itself but rather the limitations of quantitation were eliminated; as though quality were unrelated to quantity – however deeply and intimately they may be co-ordinated.

Such a situation is not unknown: for example harmonic qualities, though co-ordinable with, are not of the same category as the quantitative sound waves on which they depend. Harmonic qualities do not happen in Time, though the sound-waves that accompany them are inclusively in Time.

On the materio-dynamic co-ordinates, sequence is a quantitative characteristic. Not so spontaneity. Spontaneity is the manner in which quality acts in its own realm. It is a qualitative characteristic: as such it pertains to the functional co-ordinate.

So we see the originality of spontaneous action closely

confined to the functional field, while sequence in operation is equally closely confined to the materio-dynamic field.

But since the quality apparent in originality is not a *consequence* of interaction or of reaction, physical or chemical, of one part on another, it cannot lend itself to cause and effect analysis. Thus, originality arising spontaneously (qualification) must seem irrational. There is no evident 'cause' of quality, and motivation from the unity of the whole, by which it arises, cannot be found on the materio-dynamic co-ordinates. So the material evidence of quality – the uniqueness of the finger-prints – would seem to have arisen from nowhere.

We cannot measure spontaneous action by the most meticulous study of time periods or of space orientations because so far we lack a 'unit' of measurement, a 'unit' of specificity, or a 'unit' of origin to allow of a positive definition of spontaneity, so we still have to resort to negative definition.

All that can for the moment be said is that mutual synthesis must not be regarded merely as carrying the requisites of Space-Time, nor as having its interpretation merely in the signals and sequences of materio-dynamics, as at present understood. No attempt can be made to carry the subject further till we know in what medium the attributes of mutual synthesis characterise events.

IV. *Eclectivity*. In spite of the seeming irrationality of spontaneous action, nonetheless we have seen that it arises within a field of familiar, or group-specificity, replete with diverse individualities all related to each other through their whole. What engenders new specific diversities; new wholes? It is the *appositeness* of diverse specificities within the inhabitation which brings about this change in quality.

Within the whole, apposite specific diversities are drawn to each other spontaneously in the mutuality of subjective specific synthesis, the pairing and mating so giving rise to new entities of specificity. It is as though the mutual attraction which we see in sex were applied to the synthesis of all apposite specific diversities. They come together by some mutual qualificatory attraction. It is as though within a field of familiarity there were continually forming new locks to fit new keys, the apposi-

tion of which spontaneously motivates or creates a new orientation within the whole, and in so doing changes both part and whole in specific pattern, or quality.

These changes that arise have peculiar characteristics. The new specific diversity that is engendered does not wipe out those from which it originated, any more than in its own uniqueness the child has wiped out the specific characteristics of the parents from which it issued. What ensues is *furthr-diversification of qualitative pattern*: not substitution of one aggregation for another, as in quantitative change due to motion in Space-Time.

At the moment we can go no further than to say that in eclection there is a bionomic avidity or attraction whereby specific diversities 'choose' and may 'move' to each other in virtue of their specificity, or quality, so creating new unities and new and original wholes. This phenomenon we are going to call *electivity*.

Now in this process, though 'choosing' and 'moving' may appear to occur at different times, the one does not 'cause' the other; for both the choosing and the moving are aspects of spontaneous action whereby apposite specific diversities come together in virtue of their appositeness. They are, as it were, 'eclected'; not the one by the other but mutually through their relatedness in the field of unity.

Eclectivity, then, induces a mode of 'motion' in fields of unity pertaining to wholes; and relates to the orientation and mode of change giving rise to the specific qualitative content of such wholes.

It must be recognised that we are not here referring to any form of motion accountable in materio-dynamics and in the Space-Time dimension; hence, once again we are outside the scope of comparative methods of measurement which science has as yet provided. Nevertheless eclectivity rises into prominence as a reality in the field of organismal action in which 'wholes' have significance, so that we must suppose it to be no less subject to natural law than the known manifestations of energy in Space-Time.

Let us turn aside for the moment and look at eclectivity from the point of view of man's action and procedure.

When we make what we feel to be a 'choice', we being eclectively motivated, are being drawn into action by the spontaneous mutual attraction of diverse specificities apposite to each other within the total situation, or 'field of unity' in which we ourselves participate. Acting in *this* way, our 'choice' would herald the fulfilment of a qualitative reality resident in that whole. It would represent the fulfilment of a functional potentiality of the whole: in principle not unlike the potentiality that underlies growth in organism. It could reasonably be called the fulfilment of a *need*; a need of the whole.

Conversely, in the absence of a mutual origin of action within the field of unity, we still may get the impression of having made a 'choice' when we engage in the determinative selection of analysates from within the prescribed content of our experience: as, for example, in the process of objective synthesis. In this case selection manifests no more than the operational characteristics of the organic *mechanism*. In materio-dynamic operation it is firmly established that all motion arises in a field of chance. In such a purely selective process there can be no question of 'choice' in the sense we have used the word here. There is only a procession of causal and effective sequences, these sequences operating according to the laws of probability in a field of chance. It is necessary to make a distinction between these two situations.

This distinction in no way explains the association of *feeling* with either situation; but it does discriminate between two different processes that can be observed in the action and/or operation of the organsim. It should also be recognised that the possibility of choice, while not pertinent in any system or sequence in materio-dynamics, can *only* refer to the field of quality.

But about quality we as yet know little.

Yet one more point that arises from consideration of action in wholeness: any form of 'motion' in a field of unity must – by reason of the superimposition of wholes upon wholes – ultimately be referable to the greatest whole. So, looking once again through our bioscope, *eclectivity* becomes an attribute of the cosmic organism. Hence, like gravity in Space-Time, it must

appear as the expression of a universal: i.e., as a form of 'motion' pertinent to qualification in the organismal cosmic whole.

## Evidence of Mutuality in Synthesis

It is, as we have said, *action-pattern* that reveals mutuality in the synthesis of organism and environment. Hence it is also action-pattern that reveals in which mode of synthesis the organism is involved at the moment of action. It is the excursion of the flow and flux at the *zone of mutuality* where action takes place in organism and environment, which yields the action-pattern. Hence, the records of action-pattern displaying functional action are to be sought only *in an ecological setting in which organism and environment are in free association.*

This adds immensely to the difficulty of observation, involving as it does an entirely new set of conditions for experiment. Observation of individuals or of organisms in the isolation of a controlled environment, useful as it is to the experimenting physiologist, must entirely miss the evidences of mutual synthesis and its action-pattern records. Moreover, the presence of disease in part or whole may disguise, or deflect, the pattern of order within the whole.

Where mutual synthesis is foregone, biological order and its associated action-pattern fades into mere operational tracing. Thus the manifestations of behaviour on which the sociologist has hitherto relied are necessarily equivocal, for they may equally cover either or both of the above conditions without differentiating between them.

Where in the life cycle do we find the first evidence of the exercise of the faculty for mutual synthesis? It appears in the most undifferentiated state, probably in the ordering of the fertilisation of the ovum – as, for instance, in the swarming of the bee – but certainly in the ovum after fertilisation. It is conspicuous when the mammalian ovum enters into mutual action with the parent in preparation of the placental site; in the process of nidation, and throughout life in the womb. 'The pregnancy' – functional field of unity of foetus and mother – is the most perfect example we can cite of mutuality within a functional

whole. The 'adding' of an embryo to the mammalian mother through the placenta is to *spontaneate* a new unity of mutuality – the pregnancy. Again too, in plant life, mutuality is seen in the germination of the seed in response to seasonal changes and other environmental circumstances to which the seed and soil are open.

Indeed, the faculty for mutual subjective synthesis would seem to be *the primary* 'faculty' of the functioning entity, sustaining the biological integrity of that entity in its environment from the beginning.[1] We shall return to this subject later when discussing the nature of the faculties.[2]

Our attention so far has been given to the picture of synthesis as seen in the field of functional action: health. To emphasise its salient features, let us contrast it with that of disorder evident in disease. In disease, where mutuality of synthesis is progressively foregone, synthesis declines into a process that is largely objective and progressively confined to the materio-dynamic field. Then the pattern of order changes. In the body, we see cell integrating and reciprocating with cell; or in society, individual integrating and reciprocating with individual. The mode of motivation has changed: now it is from each severally, from the *immediate* situation presented to the cell or other entity in reciprocal operation with its neighbours. Such a non-functioning cell, individual, or organism can see, as it were, no further than the hedgerow of its neighbours. 'Seeing' only *its own* situation, it operates egotistically in claustrophobic frenzy. Materially and dynamically multiplying and repeating itself in blind ignorance of any total situation or unity therein, it acts in *dis*-unity and *dis*-ease. In this picture of non-functional existence, the degree of frenzy may be resolved by what can only be described as 'sym-pathy': arising out of experience and objectives shared in common from which the originality of subjective synthesis has evaporated. It is here, in the non-creative field of objective synthesis, that co-operation and compromise have full play. They are, in fact, the signs and symptoms of an absence of *the specific and creative mutuality and spontaneity* of functional action, implying a declension from the creativity of specific diversification.

[1] Appendix II. [2] Chapter VII.

The science of pathology is concerned with the study of the de-differentiation and the de-growth that ensue when the field of unity in which functional action arises is dissolved and the zone of mutuality becomes replaced by a zone of *re*-action. A zone of reaction is one in which there is no differentiation, but rather a de-differentiation of specific characteristics. A vivid vignette of this process is presented in the histo-pathology of the body tissues. Where inability to function arises in any area, due, say, to injury or local infection, the reaction that ensues presents the picture of an encircling fibrosis – which, as we have already said, is the body's method of isolating non-functioning cells.

This brings us back to the distinction made at the outset between the modes of action to be observed. Functional action lies in mutuality and subjectivity between environment and self. Compensative existence lies in mutuality between cells and self, but in retreat from the free impact of the environment. The third category, disease, is the expression of loss of mutuality; cells, organs, thrown back on themselves in de-differentiation.

Each of these categories has its own distinctive pattern of action, whether as seen in the cells of the physical body, or in the body social. But as we have shown elsewhere, the large majority of individuals in the body social, though 'normal', i.e. accepted as in health, are in fact existing in compensation.[1] Action-patterns of functional action thus seldom appear as more than sporadic phenomena and hence without statistical weight. It is only where the conditions of organism and environment permit of free, i.e. mutually eclective, movement, that the distinctive action-patterns of mutual subjective synthesis begin to stand out in relief, so permitting the study and investigation of health.

The picture we have attempted to draw of mutual synthesis is an unfamiliar one; but it is neither metaphysical, supernatural nor transcendental. We can safely believe our eyes. As we look at it, we may see how one man's meat is another man's poison: and how quantities may acquire quality. It may eventually even give us a 'measure' of the scope of specific

[1] see *Biologists in Search of Material*. p. 84 et seq.; *The Peckham Experiment*, frontispiece chart.

individualisation – each organism its own unique world of function – without which the process of 'living' cannot be understood.

Nonetheless, in the materio-dynamic realm referable to Space-Time, to which we are thoroughly accustomed, this picture is clearly inconceivable, for as yet we know nothing of the realm to which it belongs; a realm in which spontaneity supervenes upon sequence; order, the orientation of pattern, supervenes upon system; and wherein diversification of specificity replaces mere multiplication and repetition.

Clearly the foregoing considerations entail some realm or 'medium' other than Space-Time, in which things, situations and events *qualify* themselves. But before we can proceed to any consideration of such a medium, we have yet to learn with what instruments the action-pattern records of mutual synthesis are written. We must, therefore, now turn to examination of the major instruments of organism for action – the faculties.

VI

# Faculties: External

The last item, one that will need close attention in our definition of health, is that health, or functional action, depends upon the development and use of the *faculty* for mutual synthesis of organism and environment.

What is meant by 'a faculty'? Though convenient for use in common parlance, the word, being vague and ill-defined, calls here for some explanation and careful definition.

Any attempt to define terms in common use leads naturally enough to the temptation to challenge at every step. It must be understood that we are assuming that the proof of the pudding will be in the eating. At the moment we are merely mixing the ingredients. As we watch the mixing we may see being incorporated common ingredients which, taken by themselves, are not to our liking. But reconciliations and explanations are not for now; their significance can only appear step by step as we proceed.

We will begin then by looking at the process that leads to facultisation. But before doing so it is imperative to keep in mind the three states of existence: functional existence, compensative existence and de-compensative existence,[1] for in each of these states the faculties of the organism are used differently. Unless attention is fixed on functional action and upon the phenomena recordable on the functional co-ordinate, the potentiality of the faculties and the full scope of their action may be missed.

We have already seen that action-patterns as records of the mutual subjective synthesis of functional action are exclusively confined to the functional co-ordinate. It is necessary to

[1] Chapter 1, p. 13.

emphasise this because all *accuracy and precision* of measurement, whereby it is usual to assess the operation of the faculties, is to be seen only on the materio-dynamic co-ordinates. Naturally then, the temptation arises to wonder what more is necessary; and that stirs the suspicion that what is to follow can only lead to a world of wordy idealism, or mysticism. So again we must emphasise that the proof of the pudding is in the eating, but in the meantime not to steal the raisins nor sample the raw spices; they may not be palatable in the raw.

## Sense and Sensibility

Resuming our inspection of the living entity in functional action, we see that it has instruments on which its tunes are played. The 'special senses', for example, associated with features on the external surface of the body – eyes, nose, ears, etc. – all are entities clearly definable on the materio-dynamic co-ordinates. Nonetheless the 'special senses' are also very conspicuous items appearing on the functional co-ordinate.

Thus, looking for evidence of function, an observer inspecting a man in a laboratory of a Health Centre, would sort out for separate inspection and study: (a) the geometric form of, let us say, the ear; (b) the dynometric configuration of the ear, e.g. sound acuity and absorption; (c) the auditory 'colour' or 'quality', i.e. the functional configuration, or 'sound landscape' perceived by the individual under investigation. It is well-known that the greatest quantitative precision and accuracy in weighing and estimating sound is not always co-ordinated with a high degree of quality in 'sensing' sound. It is, however, not the accurately measurable quantitative vibrations known to the physicist, but the quality in 'sensing' sound that guides a man in his functional excursion. The quality is not to be equated – though it may be correlated – with the quantitations of, for instance, the light, sound, or heat waves that impinge upon the individual's features and involve what in common parlance is called his 'sensory' apparatus. We cannot begin to understand the nature of the faculties nor of their facultisation until this distinction has been appreciated.

The very use of the word 'sense' introduces immediate

confusion. There is an easy and common assumption that light, for instance, impinging on the eye, has the same effect upon all normal eyes, operating on the senses as it operates upon a photographic plate, automatically. Hence the 'senses', and 'sensations', come to be regarded as uniform and common to all men. This premise governs the confident and popular use of such devices as the camera, the radio, television, films, etc., all artificial mechanisms extending the use of the sense-receptor mechanism of the body. It is assumed that if it is desired to spread knowledge, the best method is one conveying 'precision' to the 'senses' – all men having a common basis of sensation as a purely *automatic* response to impact. On this assumption, the value of the film and television as an educative procedure is largely founded. This means that no distinction is made between an analysate removed from a total situation, and the total situation of which that analysed material is but a part in functional action. In other words, the 'senses' as they are commonly called, supposedly can be used apart from the subjective context of their owners; used as it were, in a '*functional vacuum*'.

So we find 'sense-organ' as the common term used for features of the body such as eyes, ears, nose, although again it is well recognised that there may be no 'sense' involved in their operation. Sherrington[1] here is emphatic:

> 'Sense-organ' very commonly does not involve sense or mind at all. It may not be a gateway to the mind: it is always a gateway to the motor individual, and its injunction to that individual may be to move or not to move. Just as a sense-organ, when it justifies its name, may be a means for starting and stopping thinking, so in the motor individual it is a means of stopping and starting motor acts apart from the mind. In this latter case it is misleading to call the organ a sense-organ. To call it 'receptor' or 'analyser' (Pavlov) avoids that misconception.

Thus in physiological experiment these 'sense-organs' may be no more than the instigating link in a chain of purely materio-

[1] *Man on his Nature.* Sherrington. Gifford Lectures Edinburgh 1937/38. C.U.P. 1940, p. 179.

dynamic events: 'reflex actions' carried out, for instance, in a decerebrate dog, where it is commonly accepted that there can be no question of any 'sense' whatever.

It is in the pattern of functional action that the sense-receptor mechanisms are to be correlated with sense; as also with *sensibility* whereby we would imply the overall capacity of organism to 'sense'. Confusion in the meaning of the word 'sense' has its roots in the fact we are here emphasising: that understanding of 'sense' involves both quantitative and qualitative considerations.

In this text we shall refer to the external features of the body as receptors – of whatsoever physical impact – and to avoid confusion shall use the word 'sense' only in its sense-data context: i.e. in terms of significance for that individual on whom the impact falls.

By this usage a clear distinction can be sustained between quantitative *operation,* and the quality of *function.*

So the features are instruments receptive of the quantitations in the environment, i.e. receptors and materio-dynamic analysers of such quantitations; while the senses, arising in conjunction with those features, will appear as conspicuous items on the functional co-ordinate associated with quality pertaining to a specific and unique individual.

This process of qualification arises with facultisation. It is an essential attribute of all faculties and is not, of course, limited to the 'special senses'. Looking critically at the field of functional action, we fail to find any distinction between man's 'special senses' and all other senses that he manifests. Every one of his bodily features is capable of being represented on the functional co-ordinate by a sense. It is a little difficult, for instance, to see why it is assumed that, say, the hands and feet have no sense, for each in its particular fashion is sensible not only of its own environmental situation, but also of the body of its inhabitation. In fact, all the external surfaces of the body are variously receptive of environmental impact, as are the 'special' receptor-organs; and like those special organs, responsive – whether that response is conspicuous or not.

Looked at from a wider aspect, we cannot deny to the relatively unfeatured amoeba, nor to the bacterium, any of

the sensibility developed in man as highly specific external or internal faculties, be it in hearing, seeing, urinating, digesting, defaecating or propagating its kind. These structurally undifferentiated organisms can grow and produce progeny with neither gut, ovary, testicle nor womb. The amoeba or any other biological entity, exists under the same pattern of necessity as man: it is in *how* it meets that necessity that it differs.

We may not, then, conclude that the many very evident senses of man exhaust the range of his general sensibility. Neither can we envisage the senses as isolated in action, but rather as special prominences, crests or waves in a labile medium, sea, or field of general sensibility pliant to the whole scope of the environment. Wherever, then, a feature is in evidence there arises in that individual, in association with that feature, the possibility of an amplification of sensibility — a 'peak' or 'wave' in the field of general sensibility, which itself remains active.

All our senses with which the faculties are associated are like that: hearing, seeing, touching, tasting, manipulating, smelling, locomotion, orientation, etc. Though some of these are familiar to us as 'special' senses, they are only 'special' in that they are a highway, a first-class route among many other roads, paths and open country. The highway is not always the most direct route: we may waste much time and energy using only the 'special' senses when there is also available a 'common sense' derived from the general sensibility of the living entity – whether critically facultised or not.

This means that man's actions are not more *comprehensive* than are amoeba's. Many of them, however, are more specific, more discretionate, and more discriminately organised. Man, amoeba and bacterium are all in mutual action with the environment. The only limit to the scope of sensibility of each is the environmental limit; and each biological entity has the same limit in its potentiality for functional action.

This interpretation of the constitution of the senses concerned in facultisation, demands a different assessment from that given by the physiologist, who requires for the accurate measurement of events, the careful isolation of the part under investigation. Impressed with the high degree of differentiation that distin-

guishes one 'special' sense from another, he sees them in isolation as 'specialisations'. The clinical diagnostician and the pathologist, aware of the vagaries of sensation and of the confusion in diagnosis to which their often diffuse manifestation throughout the body leads, are apt to seek a wider interpretation of the known facts. Aware of the 'over-spill' of one sensation into another, they use that knowledge to sort out the significance of symptoms of disease. It is well known, for instance, that when the function of one special sense – say, of hearing – is temporarily suspended, the total efficiency of the individual's action involving many other faculties is momentarily impaired. This is so even if the individual were not aware that he had been using that particular sense at the moment of impairment of function, and however quickly compensative adjustment might occur.

There is another pitfall to be avoided. It is usual, as we have seen, to regard the faculties as 'specialisations'. But we must be careful, for 'specialisation' is a dangerous word all too often carrying the implication of exclusiveness. Very few cells, or tissues of the body, are exclusive in their specialisation. Specialisation does not imply the sacrifice of variety in sensibility by the tissue, organ or organism manifesting that specific differentiation. A functioning cell specialising, for example, in 'liverness' or in photo-dynamic effect, is a specialist in virtue of its exuberance, or of what might be called its 'fertility' in that particular direction; remaining the while capable of sensibility in all other directions. Any such specialist cell in the body, be it liver or other cell, can – while foregoing its specialist faculty – yet retain other sensibilities and continue to exist at other levels. This is seen, for example, in the role assumed by local tissue cells in the process of inflammation and healing; as also in experimental interference with the functional action of organs of the body.

So far, then, we see a faculty as associated with sensation due to reception of the impacts of the environment in relation to the sensibility of that living entity, thereby resulting in the enhancement of a particular specificity of action of *that* organism in its own inhabitation.

## Capacity: Capability

Now let us look at the faculties from another point of view; again showing that they are not comprehensible merely from examination of sensation and the receptor mechanism alone.

It is important to grasp that the *capability* of doing, is not the same as the *capacity* to do. We are born with the means to do. The infant at birth is not merely structurally perfect but also physiologically competent; nevertheless, it has not yet the capability of doing. The *how* of doing has still to be attained, and it is in this 'how' that capability lies.

To make this point clear, let us look at one of the earliest faculties to be developed in the infant at birth: the faculty for digestion of physical food through the alimentary tract. If we appeal to the physiologist for information as to the facts of the digestive capacity in the newborn, he secures a sample of the gastric and intestinal juices of the infant by siphonage. The sample is transferred to a test tube (*in vitro*); he adds to the juices a well minced mass of beefsteak and onions, maintains a consistent mixture by stirring (artificial peristalsis – *in vitro*), and incubates the mass at body temperature for a requisite time. The end result on analysis turns out to be a complete and statistically normal digest such as would be derived from any adult stomach and gut. Facts thus demonstrate that the *means*, or *capacity*, for digestion are present at birth.

If now the biologist repeats the experiment in the newborn infant (*in vivo*), he meets with all sorts of difficulties. First the infant is unwilling to accept the adult food. It has to be coaxed, or even force fed, and in the ensuing struggle the facial muscles may go into violent contraction, or even the whole body into convulsive rigidity. The biologist, aware of the procedure of some of the lower species and of some primitive peoples, may coat a spoonful of the feed with maternal saliva and so, deceived by a familiar taste, the infant may admit it into the mouth, but refuses to swallow. Pinching the nose at this stage may induce a swallow-reflex, and the food approaches the stomach, only to be rejected as vomitus. A little, perhaps, has reached the

stomach to the grave danger of the infant, calling for clinical measures to avoid the worst: death. No such factual experiment is, of course, ever made, but dietary indiscretions of that order with infants are not an uncommon clinical experience: nor unknown in post mortem encounter. Biological evidence, thus shows that *actually* the infant is unable to carry out full digestion.

Though, then, the infant at birth is fully equipped with the physical *means* or capacity, for digestion, nevertheless it has not the capability to digest. It still has to 'learn' *how to do what it was born with the capacity to do*. That 'how' involves cultivation of the faculty for digestion.

All the features of the body, the eyes, legs, ears, hands, are similarly at birth already equipped with the means to do. Nevertheless, we all have had to 'learn' – and by 'learn', we do not imply 'have to be *taught*' – how to see, to hear, to walk. We have even had to learn how to breathe and how to regulate our heartbeats; and as the clinician knows, these lessons are not fully learned until after puberty. So, born with the means for action, we have to acquire for ourselves the capability of acting: i.e. our facultisation.

The significance of this is well exemplified in the case of children born blind who, through surgical operation at four or five years old, are 'given their sight'. Immediately the eyes 'see', yet the child has no understanding of what he sees. Having played with a ball when blind, seeing it he cannot recognise ball as something he knows. Having acquired the capacity to see, he still has to acquire the capability of vision: the association of the impact of light and its meaning for him.

The distinction between capacity and capability underlines the difference between the *factual* and the *actual*. It is the actual with which the sensibility of the living entity is associated. The actual is involved not merely in materio-dynamic changes but also in qualitative change in the patterned order of functional action.[1]

There is absolute diversity in the qualitative pattern of all living entities. It is the actuality – i.e. how the impacts of the environment are related to each particular entity, which leaves

[1] Appendix 36.

an impression not only on the finger-prints, but on the action-pattern in all that is done; stamping it with individuality, so adding quality to quantitation. This imprint of individuality, moreover, invades the whole field of action, from the bio-chemical pattern within the cell to the pattern of the individual's action in society.

All the faculties we have so far been considering are concerned in making contact with the outside environment of significance to *that* organism: *they bring the quantitations of the environmental impact into specific relation to that individual.* Thus we *sense* the things, situations and events around us.

In functional action all biological entities are sensitive to the whole gamut of materio-dynamic manifestations; probably to all the spatial and dynamic attributes of the environment. That may become more readily comprehensible once it is realised that dynamic quantities are just as material as sausages; and just as ingestible. It will, then, cease to be assumed that dynamic quantities are something that merely 'stimulate', for it is usual to speak of them as stimuli as though they remained as outside agents – 'excitants' – whereas all quantities are potentially diets; i.e. substantial sustenance.

This fact has recently been demonstrated experimentally in the inability of individuals to maintain their sanity (health) for more than a few days when confined within a cabin from within which all impacts from the environment have been rigidly excluded.

Indeed, all the features associated with the 'special' senses could be looked upon as 'digestive' organs, thus presenting thresholds dealing with the physicist's quanta in one condition or another. Take, for instance, pollen falling on the mucus membrane of the nose; it is not easy to conceive that what the allergic subject precipitates with such distressing symptoms is not accepted and digested in health. The 'pleasure' that accompanies a walk through a hayfield may well be evidence of its utilisation. Particles entering through the 'special' sense organs or the skin, like food prepared in the gut for utilisation by the entity and stored in the liver or elsewhere, are digested to a fine analysate, the absorbed substances either being directly used or stored in the body cells. The dynamic quanta, like

sound falling on the internal ear, or like light waves on the skin, are equally 'digested', the analysates being passed on and stored in the brain and elsewhere.[1] It is as necessary to consume sound, light, touch, heat, etc., as it is to consume nitrogen, carbon, hydrogen, oxygen.

It may be a little startling to view the eye as a kind of cavity of ingestion like the orifice of the gut enjoying a quantitative feast – a photo-dynamic ingest. And still more startling to view the faculty for articulate movement as an organised ingestive system; so that a visit to a properly-equipped gymnasium is seen as a visit to a restaurant for the ingestion of a dynamically quantitative meal! Such is the range and nature of sensation that sustains the living individual. It is through the development of the faculties by which these 'ingests' are utilised, that the living entity comes to sense the things, situations, and events around it.

The function of the faculties may be regarded as putting *specific sense* into the materio-dynamic operations of the body mechanism, and in the emergent action, giving to such materio-dynamic transactions the specific stamp or identity mark of the quality of the entity – without in the least altering the sequence of the materio-dynamic operations, or limiting or lessening the scope of the possible materio-dynamic transactions with the environment.

When, then, in whatsoever direction sensibility becomes what is termed 'special', it has not changed, any more than has lead when sharpened to a writing point, nor a ball of clay when modelled into a figurine. Its specific diversity in a particular direction has, however, been enhanced – that is, in our terms, its quality. It is this specificity in action which constitutes the essence of a faculty. So its essence lies in the stamping of the doing with the quality of individuality.

It is clear that observation of the faculties and of facultisation is fraught with difficulties for the student of function; for facultisation is bound up with the uniqueness of the particular individual. Uniqueness then does not derive merely from the initial genetic inheritance of the individual. It is also bound up with the process of his growth and development, upon which

[1] Appendix 12.

depends the present degree of cultivation of his sensibility and his present facultisation. And while the actuality of his facultisation cannot be understood apart from his own immediate environment, its manifestation also varies with the moment-to-moment expression of his vitality: i.e. his present state of existence – in health, compensative existence, or disease.[1]

But those are not the only complications that face the observer. While the organic features are always in evidence, their facultisation may, and too often does, fail to occur, action then failing to become discretionate. Or again, at any stage in the life-cycle there may intervene a state of survival or non-functional existence; so that any organic entity having already facultised sensibilities may yet fail to use them.

So in setting out to observe the phenomenon of facultisation it is unlikely that a full picture will be seen in the ordinary circumstances of everyday life; or by direct observation of any material to be found at hand. Only in experimental situations devised to embrace the total situation of the living organism in its environment (as for instance in the social setting of the Pioneer Health Centre), will it be possible to ascertain which faculties are differentiated and which are not; which active, which inert – all of which will be discernable in the inscription of action-pattern.

To this there is to be added a further consideration. Whereas statistical treatment of the *capacity* for facultisation is valid, statistical presentation of facultative *capability* is not possible – since that pertains to the uniqueness of the individual. This is appreciated by the practising physician – if not as yet by those engaged in sociological research.

But that is not all; we have come to a situation in which the functionary on one hand, and his featured body or organic mechanism on the other hand, have to be viewed in detail on separate co-ordinates. The featured body, like any machine, has the mechanical resources to deal with the quantitations of the materio-dynamic environment. The functionary has the faculties through which these quantitations may become specifically and sensibly related to himself in the qualification of his

[1] Appendix 13.

action. While the organic mechanism can respond to, the functionary alone can qualify any situation through the attribute of sensibility.

A distinction can thus now be made between the functionary and his organic mechanism. Nevertheless, we are no nearer knowing the value of the symbol, 'functionary'.

VII

# The Prime Faculty of Organism

In the previous chapter, associating features of the bodily mechanism with faculties of the organism, we found that facultisation depends on the relation of sensation deriving from the environment to the general sensibility of the particular organism involved in action. Sensibility is a general attribute of all organism. While, however, the field of general sensibility of the unicellular amoeba is the same as the field of general sensibility of man, the undifferentiated amoeba lacks the structural organic features possessed by man through which his sensibility finds expression in discriminate action.

Amoeba can be said to have but three features: its nucleoplasm; its cytoplasm, and the unity of these two, the cell-as-a-whole. Or again, in a non-nucleated biological entity such as a bacterium where the nucleus is dispersed, the bacterium is robbed of two features found in amoeba, so leaving it with but one obvious feature: 'itself'. This sole feature, the *individuality of its unity,* is common to every living entity and to all organisms however dispartite their parts may appear.

This characteristic of organism, the 'individuality of its unity', unlike all other features, is present from the beginning of the life of the entity and persists indomitably throughout all the changes of growth and differentiation – often through the most fantastic transformations of metamorphosis and in the face of strange symbiotic existences.

It is this feature representing the epitome of the total sensibility of the organism, which is to be associated with the *faculty for mutual synthesis of organism and environment.* It is the supreme faculty of organism. On it hangs the organism's sanity, or wholeness.

It is this faculty also which gives rise to the action-pattern of the organism by which functional action is recognisable. While the organic mechanism has the capacity it has not the capability for full functional action of the living organism. Nonetheless, a great difficulty faces us, for the mechanism alone is demonstrably capable of highly automatic operation. That is to say, it can carry on its operation with little reference to what we have called the functionary. So, unless we take special care to keep only functional existence in our field of view, this functionary presiding over the wholeness of functional action will seem superfluous – even exotic, or fictitious.

Though the fact cannot be ignored that even man's own body, or 'machine', is of his own making, nevertheless once it has been assembled, it has its full *operational* scope as mechanism. This must be emphasised, for here we are in no way dismissing the automaticity of the machine as of no significance. Indeed, it is on the operational capacity of his mechanism, that the functionary has to rely for all accurate and precise *quantitative* realisation of his labour – and our functionary is no mere dreamer, but a craftsman. Equipped with sensibility through his faculties, the functionary has to use that machine with all its gadgets in the process of mutual synthesis with the environment.

So because there are different methods of use of the organic mechanism, it is fundamental to distinguish between

(a) those who enjoy a fully facultised existence, in wholeness or health;
(b) those who use their faculties and sensibilities compensatively to keep the range of their existence within the limitation imposed either by their machine, or by their environment
(c) those in de-compensation (i.e. the dis-eased), the use of whose faculties is progressively curtailed as they fall back upon the automatic operation of a mechanism that is stopping.

The process of mutual synthesis of functional action is vastly different from the systemisation of the most delicately integrated and reciprocated operation of mechanism in the materio-dynamic field. As with all other faculties, the characteristic of

the faculty for mutual synthesis is that it brings factors in the environment into specific relation with the particular entity involved in synthesis, thereby changing the entity step by step in the process. Owing, however, to the mutuality of the process in which the organism engages, accompanying its every action there also arises change in the specific pattern of the inhabitation.

We have seen that in functional action this progressive diversification arises through eclectivity whereby there is created a 'field of unity' in which diverse but apposite specific factors in organism and environment are brought together in mutual synthesis. Thus, in the process of living it is upon the organism's faculty for mutuality in synthesis that hangs the spontaneous specific ordering of the entity *and* its environment. That being so, it follows that the biological order of growth and differentiation in the organism is associated with the exercise of this prime faculty.

Though all synthesis is effected by quantitative transitions occurring within the mechanism, these quantitative changes may or may not be associated with the specific qualitative change that inheres in mutuality of synthesis in functional action. Hence great care must be exercised in discriminating between the modes of use of the organic mechanism under observation. We have referred often to the employment of such different modes, e.g. when making a critical distinction between objective specific synthesis and subjective specific synthesis.[1] It is the latter which results from exercise of the faculty for maintenance of the individuality, and which alone furthers the unfolding of the potentiality of that individuality in living.

Any higher organism which has differentiated out many readily recognisable features associated with faculties for the discriminate expression of its sensibility, has not thereby lost its organismal 'wholeness'. Hence we must not overlook, nor ignore in man his primary faculty, that for the maintenance of the individuality of his unity. This is associated with a 'sense' more 'special' than any of his so-called 'special senses'. It is the overall faculty which maintains his wholeness: and on which his sanity depends.

[1] Chapter v, p. 43 et seq.

So the range of sensibility of man is greater than the sum total of his many and evident special senses. Man, amoeba, and bacterium, each represent a functional unity which is in mutual action with the environment, the field of organism and environment representing the scope of the actional sensibility of each.

Accepting sensibility as a universal attribute (at least of organism), it is not difficult to envisage each individual organism as a 'cell' in the 'body' of a vast organismal whole, both invested with sensibility. In that case, the periphery of each individual organism would become not so much an isolating, delimiting and protective barrier *against* environmental impact, but rather an 'interstitial' membrane in the sense in which Bayliss wrote with so much illumination of the membranes of the living body.[1] The external surface of the organic entity would then assume the role of a two-way differential 'membrane', or 'interstitial surface', transmitting metabolites of whatever nature, between the entity and the body of its inhabitation – each mutually sustaining the other by their respective and appositely specific contributions dependent upon the general sensibility of the whole. Were we to envisage the cosmic whole as organic in this way, it would considerably change the experimental approach to a number of biological phenomena at present not understood.

It would seem that unless the great process of synthesis *is* mutual as between the entity and its habitation, it is neither facultative, nor 'sensible'. The corollary to this is that objective non-mutual synthesis is consumptive – productive, or cumulative and repetitive. Rational perhaps; but not *sensible*.

## The Faculty for Mutual Synthesis in Action

If we look at amoeba or any unicellular organism, its actional response to the manifold environmental manifestations appears wholly indiscriminate. For instance, it is impossible to tell from its action-pattern whether it is in flight or is about to enjoy a meal. A biological entity like man, on the other hand,

[1] *Interfascial Membranes and Phenomena in Physiology*. William Bayliss. Methuen (1923).

may manifest the same sensibility with a very evident and high degree of discrimination and discretion patterning his actions. While, however, amoeba appears so unspecialised and so undifferentiated, that of course can only be relatively so, for though it has, for instance, no liver, it has 'liverness'. Just as in materio-dynamic calculations certain Space-Time factors may appear so negligible as to be ignored, so in amoeba we tend entirely to discount whatever discrimination it may have since *the amoeba as a whole* seems to represent the only mechanism for action.

At the other extreme, the actional responsiveness of man is so discrete and so discretionate as to represent a highly detailed specificity of response. Maybe that is how hitherto we have tended to ingore in man his 'wholeness' or unity and have discounted the action of his apparently 'unspecialised' sensibility, so that man has come to be regarded as a sort of sum-total of his 'special senses'. It is therefore but little surprising that any faculty specific to him – such, for instance, as his highly developed intellect and power of logic – have come to be given undue credit in the estimation of the totality of his action.

In its exercise in health, the faculty for mutual synthesis dominates and embraces all other faculties, whether undifferentiated or highly discretionate. It is as though in the case of the unicellular or 'unfeatured' individual the unique living picture of action were painted with a palette knife, while in man it is painted with a many-bristled brush. Within the scope of man's brush there are many discrete and discriminate bristles – his faculties, evidence of his capability for specificity in action. Each of the bristles draws its own individual stroke in association with the general motion of the brush, so presenting us with a great complexity of the pattern of man's action. Facultisation of mutual synthesis is effected through the 'brush' – i.e. the unity of all the faculties: not through its disparate 'bristles'.

The amoeba, or the bacterium, paints a specific action-pattern of mutual synthesis as broad as itself. Recognition of this broad picture is, in fact, one of the ways – as we have seen – in which the bacteriologist distinguishes one group of bacteria from another. Man, through his primary and major

faculty, does the same thing; paints an action pattern of his mutual synthesis which is as broad as himself. That, in fact, is how we 'know' one Smith from another; not so much by his features as by his action-pattern. It is the distinctive functional pattern of order that distinguishes one individual from the other.

As growth and differentiation of the organism proceed by eclective 'direction', sensibility comes to act more and more specifically in mutuality with the environment, thereby bringing the whole organism into further specific relationship with that environment. So in functional action (health), the unity of the brush in its life-stroke is maintained throughout in an inclusive embracing process.

In the functional existence of facultised man, there is as obvious a wholeness or unity in the stroke of the discretely bristled brush as there is in that of the solid palette knife of amoeba. But within the compass of that wholeness, the multiplicity and discreteness of the bristles – or faculties – gives an intricate patterning or order; not the mere particulation of mass.

Man is a *whole* – not an assembly of accumulated parts. And in health, or functional existence, he – just as amoeba – goes into action as a unity. So man's individuality does not lie in the preclusive and exclusive use in isolation of certain highly developed faculties, i.e. in his 'specialisation', but in the progressive specific diversification of his *total sensibility* in relation to his inhabitation.

The several faculties of the organism act, as it were, in orchestra under the conduction of the prime faculty which maintains that entity in mutual synthesis with its environment. The more skilled the flute in an orchestra, the more complete and full his per-se integration in harmony. So with the faculties, the more discriminate and discretionate each one, the more complete its orientation with the whole.

Thus to act 'individualistically' is to act in high discretion and pertinence *to the whole*. Apart from that whole, no faculty, however discretionate, has functional significance, any more than a cell has significance apart from the body of its inhabitation.

So in rendering an action-pattern, the various faculties do not write each its own record of mutual synthesis: they act as in orchestra, yielding an action-pattern that might be likened to a symphony – but with this difference, any or all of the faculties may be leader of the orchestra at any one time. The outstanding characteristic of the rendering of the 'symphony', or symbiosis in functional action, is that each instrument, including the conductor – indeed, the whole procedure – is strictly subjective. There is no 'score', only improvisation: i.e. spontaneity in action.

Thus functional action-patterns are not additive comprehensions; they are the creative record of an acme of subjective synthesis of all the faculties, co-ordinated by the supreme faculty of the organism.

In this way the order of the whole arises by spontaneity out of specific diversity: a record of quality in action.

In exercise of the prime faculty for mutual synthesis there is nothing of the inevitability of reflex-response wherein materio-dynamic operation includes only the consequences of previous sequences; pre-selections or determinations – a heavily underlined score. While reflex-response eliminates all alternatives, spontaneous action embraces all that might be alternatives.

The fact must not, of course, be overlooked that however many faculties are recognised in any organism, they may not represent the entire variety of facultised sensibility engaged in organismal action; and this apart from any recognised 'special faculties' which may fail to develop. Various 'sensibilities' designated by the physiologist as 'autonomic' add their quota to the orchestra, providing polyphonic background. These, though commonly beyond conscious use, are also beyond misuse; so that the faculty for mutual synthesis has always that number of 'responsivenessess' in harmony and tune – even in disease.

But we have been viewing the total situation of organism and environment in mutuality of synthesis. It cannot be too often emphasised that this is an approach different from that made by the physiologist in studies of the itemised parts of the organismal machine. Indeed, study of the faculties and of functional action in the organism, leads directly to an impor-

tant conclusion, namely that there is a well-defined limit to the scope of the physical scientist's exploration. Through his analytic technique, he can discover what nature can do. For example, each faculty studied by the physiologist can yield an operative tracing of its capacity for consumption-production. To know with accuracy and precision *what* the machine can do is at least half the knowledge needed for the understanding of the nature of function: though as yet the physical scientist has by no means discovered *all* that can be done. But it must be kept in mind that the physiologist depends for his records upon carefully 'conditioning' his experiment. So it is clear that physiological studies cannot provide adequate information as to the functional capabilities of the individual's faculties in action. Though the materio-dynamic capacity of the organic mechanism can be examined for each isolated faculty, its functional capability – its meaning – can only be understood in organism-environment as a whole.

The bionomist's record of action-pattern, on the contrary, can be secured *only* from spontaneous action of each and all the faculties acting in subjective mutual synthesis with the environment. The greater the extent to which spontaneity enters into the action-pattern, the clearer and sharper is the record. No 'conditioning' is allowable, or possible, to the bionomist in securing action pattern records. Indeed, the 'conditioning' necessary to the physiologist's work means to the bionomist the *de-functioning* of the preparation under study. To de-function it is not merely to ignore, it is to destroy the mutuality of synthesis of organism and environment. It puts out of function the prime faculty on which the organism's wholeness, or health, depends.

We cannot stress too often that to know 'what' the mechanism of the living entity can do is at least half the story. But without the other half, 'how' it does it, there is no *meaning* to the story of living.

The 'how' involves an *affective* relation between subject and environment. It does not lie in a mere *effective* result of the impact of the quantitations in the environment upon the materio-dynamic features of the organism. About 'what' can be done there is nothing either specific or eclectic. For

that reason 'what' can be done is amenable both to laboratory experiment and statistical treatment; hence quantitations assessed in the 'normal' can present a just factual standard of physical capacity. But in the 'how' there is something specific and eclectic – a qualitative factor which belongs to the capability of functioning of the faculties of a particular and unique individual. For that there is at present no means of measurement.

There is still far to go, for it would appear that while statistical 'chance' may provide man with his implements for action, there may have to be taken into account a bionomic '*choice*' that determines 'how' he will use them. That 'choice' is not resident in the effective means to facultisation. It lies in the affective contribution to action by the individual. But for it to become manifest in action there must of course be some materio-dynamic counterpart in the mechanism through which action can be manifested.

Any affective contribution to action in organismal living is necessarily a qualitative one. What then has to be looked for within the organic mechanism, is some organised structure from which a pre-eminently qualitative contribution might arise.

VIII

# Faculties: Internal

It has become clear that the nature of a faculty cannot be understood merely from study of events arising directly from impacts impinging on the external threshold of the body. What comes from without is met and modified by some factor deriving from within the living entity. What, then, is that factor? Can there be found within the body any source or origin, any 'internal environmental' threshold, from which a significant qualitative contribution deriving from within-out might engage in the process of facultisation?

The sources or reservoirs of material available for the process of synthesis in organism are to be seen in greatest simplicity in embryonic conditions. So it is possible that the morphological disposition of the tissues found in the early development of the embryo may yield a clue as to the essential factors we are in search of.

## Inferences to be drawn from the Embryo

The fertilised avian egg will serve our purpose to begin with, for here a shell conveniently isolates the enclosed living entity from major impacts of the environment. Within the shell the ovum is sealed up with the material requirements for its growth and differentiation up to the moment of hatching. Inside the shell, from these initial deposits of nutrient material, absorbed, digested and organised by the inmate into its body – eyes, beak, limbs, brain, internal organs etc. – there emerges a perfect chick. In its isolation the shelled egg thus affords a natural demonstration, like a laboratory 'preparation', favourable for study of the essential elements in the process of synthesis.

The first fact to attract attention is that when the chick emerges, the shell is practically empty! The provision of nutrients with which the ovum set out has been completely utilised by the occupant. Up to this point there has been no waste in the biological ordering of its growth and differentiation. This is a feat of economy in utilisation far exceeding the efficiency of any production-consumption process as yet achieved by man in the field of materio-dynamic constructs. That in itself stirs curiosity; invites enquiry as to the 'how' of its accomplishment.

What were the nutrient materials with which the ovum was sealed up within the shell? The two substances, the 'white' and the yolk, were the only provision for the transformation that has taken place. It is, then, into the origin, nature and inter-action of these two constituents that we must now look.

First the yolk. This is material the ovum itself collected while lodged in the maternal ovary, before it burst from the ovarian follicle and, after fertilisation, launched out on an independent existence as a new entity. The yolk substance, accumulated under the direction of the nucleus of the germ-cell, was drawn from the tissue fluids of the maternal body. The yolk, then, is provender which has been picked out –'chosen'– by the cell itself from its earliest inhabitation. Relatively huge as is this mass of avian yolk – ballooned out like fat stored within a fat cell – its substance has been accepted by the ovum and passed through its own highly selective cell membrane. This can only mean that this yolk substance has been rendered homologously specific to that ovum. So 'finger-printed' by the ovum, the yolk represents what might be called *own-spun* material collected and prepared by the ovum itself for use in its coming growth and differentiation.

The apparently amorphous substance of the yolk is usually regarded as inert – i.e. unpatterned with any specific character. But let us recall, first, that there are as yet few means of investigating individual specificity with any degree of nicety; and, second, that the ovum at this earliest stage is but little exercised in the process of qualification: i.e. relatively unfacultised in the differentiation of its basic personalia.[1]

What of the white of the egg? The white, a flood of excretion

[1] see Chapter XXI.

poured out from the oviduct of the hen, is wrapped around the outside of the ovum with its contained yolk, as the egg passes on its way to the nest. Packed around, but not incorporated within the ovum, the white is a *parental endowment.* It is a contribution 'given' to the ovum; not one 'chosen' by it. Since it has not been accepted and passed through its external membrane, the substance of this white has not yet been homologised by the ovum.

Having however passed through the body of the parent, the white is material of highly-patterned quality, endowed with the full group-specificity of the hen and cock, both functionally involved in fertilisation. So the white is a qualitative specimen of the 'home' – the congenially specific inhabitation from which that ovum issued. Bearing thus the specific patterns of the parenthood it is, as it were, *home-spun* material.

A significant fact here, and one to which we shall have to refer again later,[1] is that the naturally fertilised ovum ready to embark on its early growth and development, is in no way exposed to an 'unfamiliar' environment: that is to say, one with which it is not already in some specific relation. Nature has tempered the wind for the shorn lamb, for the home-spun white deriving from the maternal body is of a quality of which the ovum has already had experience. It is of the same specifically-patterned quality as that of the environment in which the ovum was immersed within the ovary of its origin. But, kithly though it be, unlike the yolk material this parental endowment, has not yet passed across the external threshold of the young individual. It has had no opportunity of being stamped with the sign manual of its individuality – however artless and inexperienced the developing ovum may be in stamping its as yet simple qualitative pattern on the issue of its synthesis.

So in the early stage of its existence we are presented with the fertilised ovum – protected by its shell from a wholly unfamiliar external environment – lying lodged between two qualitatively different sources of supply destined to be used in its process of synthesis. On the inside, is a store of its own specific incretion of homologised nutrient material. On the outside, is its endowment of white constituting an external environmental supply of

[1] Chapter x, p. 134 et seq.

nutrients derived from its parenthood and thus of an *analogous* or congenial group-specific qualitative pattern.

Since both sources of supply are utilised by the ovum before it is hatched, it would seem that in the course of its growth the developing ovum is subject on one hand to an *outflow* of material from its own-spun yolk substance, and on the other hand to an *inflow* of material from the home-spun white in which it is enwrapped.

Here, then, in the relatively simple avian egg, in fact we find circumstances such as we were looking for. Confined within the shell are two distinct and qualitatively different sources of material available for the process of synthesis; one deriving from without, the other from within the embryo itself. Each of these reservoirs of material is subtended by a membranous surface, one ectodermal, the other endodermal in relation to the embryo, thus presenting the possibility of both an external and an internal threshold of exchange for the process of synthesis.

In the course of its development within the egg, neither of these reservoirs of nutrient material disappears precipitately: both diminish gradually as growth of the embryo proceeds. It would appear, therefore, that utilisation of the two substances goes on concurrently throughout the process of growth within the egg. The embryo in action as it were carries on its synthesis with both hands: a handful of white and a handful of yolk at each step in the process. That means that the process of subjective specific synthesis going on within the shell derives from the blending of two qualitatively different materials: homologous material from within; analogous or congenially specific material from without.

These are very simple diagrammatic terms. But they may enable us to envisage the possible overall order of organismal growth and development in a new light; namely that of the association in action of quality with the utilisation of materials by the living entity.

Earlier we have seen that in subjective synthesis arising in a functional field of unity, apposite specific complements come together – 'choose each other' – by reason of their apposite relatedness, which is a qualitative attribute. In the case of the ovum within the seclusion of its shell, we now have found just

such conditions as would lend themselves to qualitative eclection in synthesis.

It must again be emphasised that we are concerned here with a qualificatory process pertaining to the living organism; not primarily with quantitations pertaining to the systematisation of materio-dynamic events in the organic mechanism.

If we now turn to the ova of mammals, we witness a great step forward in the functional efficiency of growth and development. While in egg-laying species the ovum setting out on its journey is buffered and screened against the unfamiliar and alien general environment by a circumscribing shell provided by the parent, in mammals this 'nurtural' buffering is effected by a freely mobile and active maternal body. So, from the earliest phases of its growth, instead of being sealed up with its store of preserved – that is, biologically out-dated – material, the mammalian ovum draws nutrients for its embryonic life from the parental circulation – a completely up-to-date source of supply. This new provision enables the embryo to feed ad lib on fresh nutrient material which, through the maternal host, is in minute-to-minute – nay, *spontaneous* – relation to the ever-changing environment. It is as if the embryo chick within its shell operates on a capital account laid down on a predicted basis of its needs, while the mammalian ovum is in the privileged position of having at its disposal from the moment of its implantation in the womb, a bounteous current account upon which it may draw continuously for its needs as the future demands.

In accordance with this evolutionary advance, the mammalian ovum will presumably have no need for an initial endowment of home-spun white, and little need for any large store of its own-spun yolk substance. What in fact do we find? The mammalian ovum has no recognisable white; and before implantation in the womb it carries but a small store of own-spun yolk scattered throughout its cytoplasm, this provision apparently sufficing for its relatively short roving phase until, having thrust its roots into the rich nutrient soil of the maternal womb, it is ready to grow.

Before looking further into the provision for this ovum, the fact must not be overlooked that at the very early stage of

ripening within the ovary, it has in turn made its own contribution to the maternal economy, so inducing in the ovary as it leaves, a secretion by which the maternal body is qualitatively prepared to receive back into its tissues a new and unique, i.e. specifically diverse individuality. Compare this with the rigid rejection by the body of all alien foreign bodies, tissue grafts, etc., which are not specifically related to it. In the earliest growth phase of the ovum, the ground has been prepared for a continued mutuality of synthesis between itself and its parent.

No sooner embedded in the womb and so in a position to draw freely on the maternal circulation for its nutrients, the human ovum from the innermost cells of its endodermal layer, proceeds to form an internal membrane enclosing a sac technically known as the secondary yolk sac. Into the cavity of this sac, the ovum secretes a store of substance, the nature and significance of which is at present unkown. But whatever the substance, it can be no other than homologously specific to that new individuality, and hence different in quality from all that is generously available on its ectodermal surface in contact with the maternal supplies.

That the contents of the sac are active and important to the embryo for its programme of growth is clear, for there is evidence of absorption from this sac into the tissues of the embryo. Indeed, one of the earliest signs of organisation in the developing human ovum is the appearance of blood islands in the mesenchymal cells lying immediately adjacent to the encircling endodermal membrane of the yolk sac. From these blood lacunae are formed the *earliest* vascular channels to appear in the ovum. They connect the yolk sac with the developing cells of the embryonic body. Later they come to constitute the important vitelline circulation in the embryo. Ultimately, these vitelline veins become incorporated into the blood vessels of the adult liver, whence they are connected with the general circulation via the right atrium of the heart.

This early appearance of a vitelline circulation infers a flow of material passing to and from the yolk sac as one of the earliest processes arising in the implanted ovum.

So in the mammal also, the embryo about to set out on its

programme of development lies sandwiched between two sources of supply of different origin: a home-spun parental moiety from the placenta and an own-spun moiety from its own yolk sac. In principle, then, we are back to the position demonstrated so clearly in the shelled embryo; viz. growth arising from the blending of contributions from without-in and from within-out, each of these contributions having its own qualitative identity.

## The Fate of the Yolk Sac

As organisation proceeds, the young human embryo, now elongated from head to tail, traces in its growth a half-encircling course round the yolk sac, thereby constricting the neck of the sac. But before the sac is entirely cut off by this encircling movement, the secreting membrane that bounds the sac has thrown out a prolongation to meet the slender elongated body of the embryo. In its growth this membraneous prolongation of the sac comes to extend from head to tail of the as yet almost undifferentiated embryo, whence it is taken up into its body, there becoming the primitive fore-, mid- and hind-gut.

Concurrently with this penetrative growth of the yolk sac membrane, the sac itself shrivels and finally disappears. But, by this time the *functional secreting membrane* of the yolk sac has already become permanently lodged within the body of the growing entity. There, now in a position actively and permanently to maintain an internal threshold of exchange within the body, it is presumably able to carry on its primary function – the choice and collection of own-spun material to meet the growing embryo's requirements.

Concurrently with this re-distribution of the yolk sac membrane within the embryonic body, the vitelline blood channels associated with the yolk sac membrane have developed into the important vitelline circulation of the embryo whence they become linked with the main dorsal vessels that bring to it nutrients from the placenta.

The development and persistence of this vitelline circulation throughout embryonic life would thus appear significant, since it affords a means of transport between the internal (yolk sac)

membranes with which the vitelline circulation is associated, and the external surfaces from which the embryo draws its nutrients from the maternal supply.

## Anatomical Distribution of the Yolk Sac Membrane in the Adult Body

We have seen the membrane taken up into the body of the embryo, there becoming the primitive fore-, mid- and hind-gut, together with an allantoic prolongation considered by the embryologist to take part in the development of the adult vaginal wall. As embryonic growth proceeds, from the fore-, mid- and hind-gut there grow out buds destined to become important structures such as the anterior pituitary, the thyroid and parathyroid bodies, the thymus, pancreas, liver and lining of the lungs, as well as the lining membrane of the gut in almost its full length.

Some of the buds that develop into the above organs, for example the thyroid and pituitary, become entirely cut off from the lumen of the gut, so providing endocrine-secreting organs; others retain their connection with the gut surface by ducts delivering secretions into the lumen of the alimentary canal. It is not difficult to envisage both these types of organ as concerned in the elaboration of a contribution to the organismal economy from an 'internal environmental' source; in principle, a source such as a yolk sac constitutes for the shelled ovum.

On this basis we could reasonably regard those organs developed from the yolk sac membrane – the gut for the time being excepted – *as internal features developed on the threshold of an internal membrane*, in the same way as the external features, e.g. the special sense-receptor organs of the body, are developed from the skin, the body's external integument.

Comparing these internal features deriving from the yolk sac membrane with the external features of the body, we find that they also – like the external features – are paired structures: two thyroids, two livers, two lungs, etc. The significance of this pairing of features is a subject to which we shall come later. Only the gut is excepted from this category. It is perhaps here worth recalling that it has been suggested from phylogenetic evidence

that even the gut is to be regarded as having developed from the fusion of paired structures.[1]

## Functional Significance of the Yolk Sac

Though the embryologist acknowledges that the yolk sac must have significance in early development, no suggestion has hitherto been offered as to what its function might be. Here we have a clue provided by the simple and primitive structure of the shelled egg making clear the distinctive origin and specific qualitative difference between the substance of the 'white' and the yolk. Without it we should be at a loss to find any meaning in mammalian conditions for the special provision for transfer of material from the yolk sac, running side by side with the almost simultaneous establishment of an ample placental source of nutriment for the embryo. Still less could we understand the significance of the permanent inclusion of the secreting membrane of a temporary structure – the secondary yolk sac – within the intimate structures of the adult body; nor why the earliest circulatory channels of the embryo should be formed in connection with a temporary structure, the yolk sac; and why these channels do not become obliterated as the sac shrivels, but on the contrary become finally incorporated in the main blood vessels of the adult body as some of the most important conduits concerned with the transfer of metabolites, as for example in the liver.

We then see in the relatively simple avian egg the blending of an internal homologously specific complement along with an external congenial group-specific complement as the pattern of synthesis. So, finding that derivatives of this yolk sac become woven into the structure of the adult body, there giving rise to organs and membranes recognised as of deep significance in metabolic turnover of the entity, it would seem safe to presume, till further research can provide confirmation or contradictory evidence, that the *essence of the function of the original yolk sac membrane is carried over into its new permanent lodgement in the body structure. Here it continues to function as an internal threshold, or*

[1] see *Origin of the Vertebrates*. Gaskell. Longmans (1908).

*endothelial membrane yielding a homologously specific complement necessary for mutual synthesis both in the embryo and in the adult.*

Having traced the development of the yolk sac membrane into recognisable internal features of the adult body, if we now turn to such evidence as disease can yield, we find that disorders of these internal organs – features of the internal environmental surface – are peculiar in that clinically they are involved in emotional disturbances of one sort or another. Modifications of the intensity of the feelings coming from within is, for example, an outstanding feature of thyroid disturbance: erratic, maybe violent, display of feelings or emotion can result from pituitary disturbance. Even liver disorders are traditionally associated with changes in the feelings of the individual.

The position of the lining membrane of lung and gut – also derivatives of the original yolk sac membrane – is confused by reason of both being clearly exposed on one face to the external environment. In the case of the gut, however, it is evident that, *in vivo*, the 'feelings' of the individual coming from within-out, influence absorption from its surfaces; although *in vitro*, the mechanism of the gut can operate without any such directive from within.[1] *In vivo*, not all that arrives in the lumen of the gut is accepted, absorbed or utilised. Much is rejected at the threshold and passed out. Moreover, the fact must not be overlooked that in health only that for which the individual has *appetite* is even allowed to reach the gut surface. In functional action, food is particularly subject to 'choice' – i.e. to utilisation by qualitative eclectic action.

The extensive and highly intricate sensory-motor nerve system linking the external surfaces of the body with the brain and muscular system is common knowledge. That there is in all higher organisms an equally extensive and intricate nerve system associated with what we can now call an 'internal environmental threshold', the whole of that system being concerned with a deep and primitive feeling circuit, would seem unquestionable. We do not propose to carry this subject further at this juncture. Here we are concerned to show no more than that (a) there exist in the body anatomical possibilities which provide a threshold of inflow from without-in and a threshold of outflow

[1] Chapter VI, p. 70.

from within-out; and (b) that the material available for synthesis from these two thresholds is qualitatively different, one having a homologous, the other an analogous or group-specific relation to the entity.

In considering the faculties, we found that it is through the faculties that factors in the external environment are brought into relationship with a particular individual. The two morphological systems we here envisage provide the possibility of a functional correlation facilitating the blending of the 'self' with that not yet of the self, so facilitating maintenance of the integrity of the individuality in subjective synthesis throughout its growth and development.

Nevertheless, recognition of two distinct anatomical systems essentially concerned with subjective synthesis of the living entity, must not be taken to mean that the process of facultisation can or will be wholly accounted for in these terms alone.

*Note.* Details are given in Appendix 14 concerning the intimate structures of the thyroid gland and the path taken by its secretion as it leaves the internal environmental threshold.

IX

# Bipolarity in Facultisation

There is another characteristic of the organism to which attention must now be given. It is a commonplace fact that in the body of each individual all the features or organs, whether internal or external, occur in pairs – eyes, ears, kidneys, hands, lungs etc. And while it is customary to speak of other organs such as tongue, heart, liver, thyroid, brain as single organs, they too in fact are paired. Embryologically they arise as paired structures; moreover their circulatory and nerve supplies are paired, and remain so throughout life. At once their dual nature becomes obvious when one or other of the pair is paralysed. Although, however, duality of features runs throughout all biological entities that manifest any degree of differentiation, hitherto no general significance has been attached to this duplication.

As mechanical units, each eye, ear, hand, kidney, is well capable of operating on its own and of compensating for the loss of the other: as seen, for example, in surgical ablation, injury, or experimental manipulation. So it is easy to see how these pairs have come to be regarded as identical organs. Indeed, quantitatively they are identical instruments operating as equilibrators, like the scale-pans of a balance. Each eye is capable of absorbing or consuming so much light and of accurately measuring and weighing the influx. This equilibrating action can be appreciated, for instance, in the case of the muscular action of the two tongues; for where one (side) is paralysed, the impaired equilibrium makes the propulsion of food a difficulty.

The functional significance of this reiterated duality is another matter. Functionally the pairs of features, or organs, do not act

as two, i.e. each one independently; nor as two 'halves' of a unit. They act, as we shall see, as two complemental diversities – in unity.

In the case of two 'halves' of a unit, where each half is identical, the two are interchangeable; there is nothing to choose between them. They are 'equities' – like a pair of sheets. As such, each bears the same relation to the other and also to the unit to which they belong. On the other hand, in the case of complemental diversities acting in unity, since each of the pair is different – like a pair of gloves – they are not interchangeable; not equities. Being different, each bears a specific relation to the other and to their whole, or the unity they constitute. It is important to grasp this difference in relationship as between two equities, halves of a unit working in co-operation, and two complemental diversities acting functionally in unity.

The necessity to recognise the distinction between a 'unit' and 'unity' has appeared earlier in discussion of the difference between motivation from each part severally, and motivation from unity.[1] In order to sustain this distinction, in this text 'unit' will be used in the strictly technical sense as applicable in the materio-dynamic field; while 'unity' (the meaning of which will continue to be developed as we proceed), will be used in respect of qualitative attributes of action referable to the functional co-ordinate.

The most prominent functional unity of such diverse pairs in biology is that of the sexes where the two diverse but appositely complemental sexes, the 'parents', form the unity of 'family'.[2] To this outstanding functional unity we shall return later in this text. Here we will first look with some care into the functioning of one pair of features of the organismal body that has already been closely studied and which has long been recognised as acting as a unity: viz. the eyes, participating in *vision*.

## The Stereographic Principle in Functional Action

The faculty for vision is not, of course, to be confused with the optical capacity for 'sight'. Optically, capacity for sight pertains

[1] Chapter v, p. 55 et seq. [2] see *The Case for Action* and *The Peckham Experiment*.

to each eye separately and independently. By the time of birth, each eye is structurally perfect and each has full capacity for sight. The two eyes are set side by side in the body, hence each has a different location in space. This means that even when acting together and in focus, each eye views a *different* aspect of the same object in the field of view. In the vision that ensues, these two 'views' play their part as diverse but apposite complements in a subjective synthesis. The stereograph deriving from these two different aspects, enhances the individual's appreciation of the object seen.

So it is only when regarded analytically as separate instruments that the two eyes can be considered as operationally identical. When an individual's two eyes, each viewing a different aspect of the same object act in unity, they become a pair of *diverse* though *apposite* organs, constituting the two poles of a bipolar field of function. It is this bipolarity of two diverse complements functioning as a unity, which enhances immeasurably that which is to be gained by the individual from the optical field.

While, then, physiologically we have two eyes, functionally we have a 'unity of eyes' from which vision arises. It cannot be too frequently emphasised that vision deriving from the eyes acting mutually and subjectively in unity, is no mere quantitative reproduction of either or of both of the optical graphs. Vision is a 'creation', an 'original' belonging specifically to a particular individual. Here, we encounter a *reality of quality* pertaining to the functional co-ordinate.

It might be objected that because this reality pertains only to a particular individual it is without general or universal significance, so that it should – indeed must – be ignored in any scientific and statistically verifiable assessment. That is correct as long as science is confined to investigation of the *means*. But as we pursue consideration of bipolarity in the functional action of the living entity, it will become clear that while the *means* lie in the optics, the *meaning* is in the vision. It is the meaning which is the guide and motivator of all discriminative action – in the living individual.

But a strong note of caution is needed at this point. The stereographic action of the faculties is not 'seeing things from *both*

points of view'. To see two different images of the same thing at once is to 'see double': that is diplopia – a serious symptom in pathology and one which heralds a limitation of action. Yet it has become the contemporary fashion to credit this analytic achievement of 'seeing things from both points of view' as the hallmark of high intellectual virtue. Here, we have already seen that facultisation in the fullness of its organismal expression is not the resultant of any analytic process: it is a creative synthetic process.

That in functional action a process of analysis *follows* upon facultative action, is not denied as we shall see later.[1] Indeed analysis – or catalysis – is probably of the nature of every digestive process and hence of the digestion of all types of experience. Though in functional action, the resultant analysates may afford the material for the next step in facultisation, they do not ipso facto initiate or generate that next step if it is one of mutual synthesis and so fertile. No analytic process of itself can yield the creativity seen in growth and differentiation; nor yield the order peculiar to organismal living.

The physiologist is not, of course, immediately interested in the synthesis of meaning arising with stereographic action. Concerned with the capacity of each organ under investigation, he treats bipolarity as the coupling of *identicals* and finds that each organ or part can yield a relatively similar operative tracing of its materio-dynamic capacity for consumption–production which can be measured. So that, in emphasising the significance of bipolarity in the individual's general functional capability for action, we are looking at what seems superfluous in materio-dynamic terms: like 'colour', that overlies wave motion, or 'music' that overlies sound waves; or again like 'order' that overlies system in the living entity. It is not until we begin to investigate the individual's capability for action in his own total situation, that the two eyes must be recognised as diverse apposite organs of 'vision'; not merely as equal and opposite instruments of optics.

But let us take another pair of features. The ears, for example, act functionally in the same way as the eyes; though since we are not able to shut one ear at will the stereographic action of this

[1] Chapter xx.

pair is not so apparent. Only when 'going deaf' in one ear do we suddenly realise that our orientation is disturbed and that, while still aware of sound, we cannot estimate with the usual accuracy the direction from which it is coming – if indeed we can even recognise the exact nature of the sound. The difference lies not in the sound but in the quality of our own appreciation: a subjective phenomenon.

In functional existence all our facultative data are probably derived in this way, for duality of features both on the external surface and within the body appears to be almost universal in all organisms showing a high degree of differentiation. So, for the purpose of experiment it would seem reasonable to assume that wherever we find this duality, it has significance for functional action; and that all the paired features can act facultatively as 'unities' of complemental diversities.

For example, we should consider the possibility of the kidneys acting in the living entity as diverse poles of a field of function looking out, as it were, over the total situation of the body of their inhabitation as a 'unity', so presenting a functional stereograph of the body's circumstances from the 'renal point of view'. Indeed, in view of the complementarity of the pairs in the body, we might even vividly describe all the features assembled on this Noah's ark principle as 'sexed' had not that term acquired many false and foolish associations. Or again, the paired features could significantly be regarded as 'right' and 'left' handed had the bi-manual function of the hands not long ago ceased to be appreciated; for when both hands can be used with equal facility, the individual is naively said to ambi-dextrous!

We have only to shut our eyes and set about feeling any large and unknown object with one hand to realise the significance of the bi-manual approach in the estimation of simple things like weight, shape, etc. Again, we can only easily do one thing at once with our hands, the reason being that actually both hands are (unconsciously) occupied in what the one hand is doing. That we can train ourselves to do two things at once does not negate the inherent unity of action of the two hands.

It might not seem important that hands are arranged to act mutually in manipulative synthesis, yet in the rehabilitation of a man who has lost a hand or arm – even the left arm – it

becomes apparent that bi-polarity of manipulation plays a very important part in his action. Unless the recollective 'ghost' of the arm that is lost can be kept alive, the manipulation of the remaining arm or hand is awkward – even in one-handed actions. Further, the disorder, if not dealt with by the 'ghost' method, will spread from hand to shoulder, to chest, and even to leg and gait; so that an acquired a-symmetry seems almost contagious in the body. The 'ghost' method is that of keeping the body *as a whole* in what could be called active memory. It is the real basis of the ambulatory non-splint method of treating injuries.

Sensibility pervades the whole organism, it is not merely a local attribute of any parts or part.[1] Through its sensibility the organism is aware of all the forces of the environment. When any interruption supervenes in the bodily mechanism through which sensibility finds expression, the action-pattern changes. Then an operational tracing uninfluenced by the affect of the whole appears; as seen in the awkwardness of the one-handed man who has lost not only his arm but with it the overall sensibility of his individuality. So loss of bipolarity in the facultisation of any one organ, can disturb the expression of the primary faculty for mutual synthesis of organism and environment – through which health is maintained.[2] This has an important bearing on medical practice. The first indication of the onset of pathological disorder in the body may appear in a change in the action-pattern of the individual. But this is something only the general practitioner is likely to know about.

There are other factors arising from bi-polarity of the faculties which may well influence action-pattern. For instance, the actual positioning of the poles is likely to contribute to the quality of the functional action-pattern. So it should not surprise us to find that eys set closely together give rise to a quality in functional action different from that of eyes set widely apart; for their stereograph is different. Hands set on arms on a narrow chest, like eyes set close together; feet inturned or out-turned; wide or narrow pelvis; chest and pelvis set close together or wide apart; narrow or wide-spread nostrils, will probably all be found to yield action-patterns of differing quality.

[1] Chapter VII. [2] *ibid.*

In these examples we have moved from obvious organ pairs to different areas of the body, seen as poles in a bipolar field of function. But we must not allow the comparative ease of associating bipolarity with obvious bilaterally paired features to limit the issue of what might constitute bipolarity of function. For instance, a functional bipolarity – head and tail – is well recognised in biology.

There are also bipolar attributes of areas yielding other experience. For example, each individual has a temperature 'sensibility' the two poles of which are 'hot', 'cold'. Although for the physicist 'hot' is represented by a degree of temperature this is not so in the field of quality. There, 'hot' is an individual's own appraisal of a stereograph of apposite differences – an appraisal deriving from his feelings. This stereograph, like all others, yields subjective phenomena for that individual alone. Here, 'cold' is to 'hot', 'hard' to 'soft' as are the sight of his right to his left eye, and so on. Action ensues from this stereograph: there is no need to wait for the quantitative balance to come to equilibrium for a quality answer.

Although, then, the events which give rise to the expression of sensibility may in some measure be represented on the materio-dynamic co-ordinates as linear, thermal, or mechanical measurements and ratios in reference to particular parts or areas of the body, on the *functional* co-ordinate the bipolarities arising from feeling from within the individual, e.g. hard-soft, right-left, hot-cold, are in each case all apposite complements of a unity in functional action.

The sensibility of the organism is not evidenced in a simple and direct way in effective obedience to materio-dynamic events; for there may be all sorts of 'blind spots' – that is to say, of non-facultised sensibility. As there are strange gaps in colour-vision, so for example with our awareness of 'roughness', 'smoothness', the materio-dynamic scale for which runs from proton or atom to the finity of the universe. These are not due to gaps in 'wave-lengths'; they are gaps in facultisation; i.e. in the specific discrimination of a particular individual. Sensibility is very variously facultised in each individual.

There is other evidence of sensibility not bearing direct reference merely to the materio-dynamic events that underlie

sense-reception. In moments of great emotional stress, as for instance in battle, an individual may – at the moment of impact – remain wholly unaware of serious or even mortal injury; or in an effort to save his child or his wife, may face and surmount lethal danger, which knowledge derived from his sense-reception mechanism alone would utterly forbid. Sensibility, upon which action hangs, is subject to an affective factor deriving from within the individual. This may, or may not, be evident in his feelings. It is significant, however, that is can be appreciable as feeling.

## A General Field of Bipolarity of the Organismal Body

Our contention is that functional action, at whatever level, arises in fields of unity associated with bipolar attributes of apposite but specifically diverse complements; and that it is this which results in a qualitative change in the apprehension of the individual. The living subject cannot be envisaged as a passive factor responding – like a photographic plate – to the impinging quanta of light on a static medium. Though the organic mechanism may respond accurately to materio-dynamic events, as in a decapitated animal, in the living, action depends not only upon what comes from without but *also* on the individual's own contribution from within. So then in functional action, just as we recognise an external threshold at which new material elements are acceptable for synthesis, equally we must anticipate an internal threshold contributing from within that which is individual: of the 'self'.

Already we have disclosed a morphological basis in the body which might account for the individual's own material contribution from within – an internal environmental threshold bearing its own internal dual facultative features as does the external environmental threshold of the body.[1]

So the organic mechanism would seem to present the structural possibilities for an overall stereograph deriving from an internal and an external threshold, the diverse poles of which are without and within. These two poles acting in unity constitute yet a further functional field of bipolarity. In this way the

[1] Chapter VIII.

organism in functional action is in a position to derive the overall meaning from its relation to its immediate environmental situation. Such a stereograph would appear to fulfil the essential requirements in relating the environmental income to the 'self' of the individual organism.

We can speak of one pole in this bipolar field of unity as that of sensation. It would be convenient to have some term with which to refer to the contribution from within-out. Without knowing anything of its nature except that its contribution is of own-spun quality, homogeneous in its specificity, let us for the moment assume its association with *the feelings* – they at least come from inside us. So temporarily the organismal stereograph deriving from without-in/within-out, might be referred to as that of *sensation-feeling*. Whatever we call it, however, this field of unity is one which embraces all other lesser faculties, however developed and finely discriminate any one of them may be.

It must be appreciated that any two appositely related pairs that do not function in bipolarity will operate in uni-polarity: i.e. each in a field of its own. In this case one pole – the stronger member – will be apt to take over, the other pole falling into disuse. This separateness of operation, however, may quickly become masked by compensatory contributions from other forms of facultisation. So their failure to act in unity may easily be missed by any observer. Still more important, the power of memorial recollection to which we shall have to give very full attention later,[1] can functionally replace one eye in those who have lost an eye. The situation is different for those who have always had but one eye. From birth they have been deprived of the advantage deriving from optical stereography, although by other means they may come to adjust their 'one-eyed' experience to a working appreciation of spatial phenomena.

Again, the complementarity of the two poles may be far from balanced – as is the case with a 'lazy eye'. Or the poles may be, as it were, 'cross-eyed'. Then the view of the one is discounted or becomes subject to disuse atrophy, so resisting or destroying action in mutual synthesis. The time will no doubt come when as much attention will be given to the adjustment of functional

[1] Chapter xv et seq.

bipolarity in all the faculties, as is now given to the treatment of optical squint.

The stereographs of action constitute essential material for the student of function. Unfortunately as yet we have nothing to guide us but action-patterns. In pursuit of our theme we have penetrated fields of experience which are beyond the means of geometric and dynometric measurement and so are outside the realm of contemporary physical science.

Examination of the function of the faculties has taken us into strange places, wherein action is seen as the result of an *affective* relationship between organism and environment, as well as an effective one. Entangled in the subjective, we have been led to seek channels through which a material counterpart from within to that which comes from without (i.e. from the external environment), might be available to the body in general in its synthesis. We have intimated that this contribution from within is to be associated with the feelings. But this does not explain the phenomenon of the feelings; nor advise us of their origin.

Feeling is, as we are well aware, a subject that has been excluded by the scientist from all his conclusions and judgements based exclusively as these are upon the group of experiences governed by the sense-receptor mechanism. But no wonder. How could he, for example, trust the register of temperature to the subjective appreciation of the individual? He was wise, indeed, not to attempt any comparison between quality and quantity – since one man's 'hot', 'red', 'loud', 'smooth', cannot be compared with another man's; and what is more, any or all may vary in quality from moment to moment in the same man.

Nevertheless the feelings, though essentially qualitative, are natural phenomena; and as such they cannot be excluded permanently from the scope of the scientist's legitimate field of observation and study. If the process, living, is to be understood, a means will have to be found of relating quantity to quality on a comprehensive and at the same time rational basis.

## Bipolarity of Organism and Environment

Up to now we have been discussing bipolar fields of functional

action associated with the structural features of the body. We must now turn to bipolarity in another and yet more extensive field; namely that of the living entity within its inhabitation, whether that be the cell in the body, or the organism in its environmental inhabitation.

We have already recognised the 'individuality' of the organism as its prime faculty whereby it sustains its identity in its inhabitation.[1] Again here is yet another bipolar field of unity in which functional action arises. The poles are represented by the 'view' of the entity and the 'view' of its inhabitation.

This is easy to appreciate in the case of the cell where the stereograph deriving from the two diverse poles, cell and body, sustains the order of the whole and gives 'meaning' to the very existence of the cell. It is more difficult to envisage a similar situation in the case of a free-moving entity in an environment to which there appear no limits. But while quantitatively the environment may appear unlimited and unspecified, we have already seen that qualitatively it is specifically patterned and ordered. It is through this patterning that a mutual relationship can be established with the specificity of the individual. This is recognisable in what the individual takes from the environment, and by what he 'gives' back to it as a result of synthesis, both of which bear a specific relation to his own individual and specific constitution. The patterning, or qualification, arises from the two poles in the unity of action.

But perhaps the easiest approach to the understanding of bipolarity of action of organism and environment is by use of the concept on which this thesis is based – cosmos, an organismal whole. In that case each living entity can be seen in the same qualitative relationship to the whole, as each individual cell in a body bears to the body of its inhabitation.

[1] Chapter VII.

X

# The Faculty for Genesis

## I. GENERAL CONSIDERATIONS

There remains to be examined one further faculty: the *faculty for genesis* – on which hangs the evolution of the species.

The scientific study of genesis has largely been focused on a specialist branch of technology, genetics. The geneticist, concentrating on the content, i.e. on the chromosomes of the cell, had until recently but little interest in the context of the cells in their development. Hence in the early study of genetics everything but the chromosomes came to be regarded as so much wrapping and packaging of little moment for an overall understanding of genesis.[1]

This situation was indeed as if the opthalmologist studying vision were to concern himself only with the rods and cones of the retina, ignoring the cornea, lens and other filtering substances through which the light waves must pass. Yet the chromosome bodies of the ovum can only become functionally active through the membranes of the cell that surrounds them. They lie in the depths of the nucleus, enclosed in its 'focusing' nuclear membrame; while the nucleus itself is embedded in the cytoplasm of the cell encircled by its cell membrane. Both of these are surfaces in continuous active relationship with the chromosomes of the nucleus. The chromosome system within the nucleus is inevitably subject to these potent factors: from these its functional action in development is inseparable. This, modern studies of genetics are amply showing.

The chromosome system of the fertilised ovum determines the

[1] Appendix 15.

prospective structural distribution in each individual of the male and female features of the faculty for genesis. But, as with all other faculties, the method and circumstances of facultisation have to be understood.

In its development, the faculty for genesis is unique in that it begins as an endocrine or *internal faculty* and, without losing its endocrine function and relationships, later becomes also an *external faculty*. This faculty, then, is no 'special' faculty of any part of the body; it is a faculty of the organism as a whole.

As we saw earlier,[1] the structural basis for facultisation in general lies in the disposition in the body of paired anatomical features, or organs; these, though structurally similar, are functionally diverse. Through the mutual synthesis of the pairs in action, there arises a new factor carrying the meaning for each individual. This meaning, as in the case of vision, is subjective and of qualitative import. In this respect the faculty for genesis does not differ in principle from all other faculties. It too is represented by paired organs, both in its internal and its external aspects.

If we look at sex from the point of view of the internal faculty alone, we find that the sex glands – testes and ovaries in the male and female respectively – are paired structures; so presumably these organs too act in functional bipolarity as do the other paired organs of the body. This anatomical distribution of paired organs within each individual body serves, however, only for the progressive facultisation of the internal faculty for genesis.

When the times comes for facultisation of the external sex features, the biological events, anatomical and functional, proceed on the same principle of paired organs each to be symbolised by a diverse functional exponent; but that functional exponent is now raised to a higher scale in biological economy. The two 'organs' that now become involved are no less that two free-moving individuals: the male and the female. Already, each of these is permeated throughout, physically and functionally, by diverse sex attributes deriving from the prior development in each of their internal sex facultisation. In biological order, the development of the external sex faculty follows upon the full development of the internal sex faculty in each of the pair.

So from the functional aspect, the male and female *persons* now

[1] Chapter IX.

appear as the two diverse but apposite parts that together constitute the functioning *organism-as-a-whole*. Only through this organismal whole can the faculty for genesis reach full development in those species in which sex is represented by two separated individuals.

We have already given much attention to the fact that all the anatomically paired organs representing the 'special faculties' are so situated that each organ is exposed to the same objective experience – but from a different aspect. Diverse views of the same experience yield, as it were by 'stereographic enhancement', a novel subjective synthesis which is creative. This is conspicuously exemplified in the case of the diverse parts, male and female, that constitute the organism in any of the higher species. It is from their diversity alone that issues the creation of new progeny.

Though the most outstanding example of creativity, the progeny are not the only issue of the bipolarity of function of the sexes. The different aspects of experience as seen by male and female respectively acting as a unity, will yield a novel creative subjective synthesis of *everything* encountered. So it follows that evidence of the expression of the faculty for genesis is to be sought not only in the production of children, but in every thing, situation and event in which the diverse sexes are engaged in mutuality of action.

As with meaning wherever sought, the meaning of sex can only be understood in its context. Hence it will not be found in any analysis of the individual male or the individual female, but only where each is seen in the context of the other.

Here we are faced with a language difficulty. There is no terminology, no word, either in scientific terms or in common parlance, sufficiently exact and comprehensive to convey the amplitude of functional action of this unity of the diverse sex pair. The term 'mating' is technically equivocal, meaning at one time the copulatory act; at another including also the processes that lead up to copulation together with the sequence of events that follows in the production and rearing of the young. The term 'marriage' is equally equivocal. In the moral sphere it implies a bond linking two persons of opposite sex in permanent union, either by love, or, where no unity exists, by discipline;

while in the secular sphere the word implies no more than the constitution of male and female as man and wife according to the law and custom of the nation to which they legally belong.

In order to emphasise the functional unity associated with the full expression of the faculty for genesis, we use the word 'family'.[1] The meaning of the word here has been deliberately extended to cover a definite and *basic bionomic entity* of high functional potency. In this defined sense, it becomes a technical term, such use to be distinguished from the general use of the word where it may imply no more than the sum of individuals – parents and their children – of which any family is composed.

As a technical term standing for the organism as a functioning whole, the word *family* embraces not only a fully mature parenthood with offspring, but equally the mated pair whether with or as yet without children.

While, then, the physiology of genesis can be explored in isolation, be it in a simple cell or in a developed male or female person, sex in its functional aspect must be looked at as a whole – content and context. This means that we are prevented from pursing the subject in a logical and sequential fashion, looking first at the development of the internal faculty and next dealing with the external faculty, but must turn our attention at the outset to the context in which sex facultisation must arise in all its phases.

This inescapable context is the *home*.

## The Qualitative Nature of Home

A family functioning in mutuality of synthesis spins about itself in the environment a zone imprinted with the insignia of its own specificity, so invoking a functional field of action within its immediate environment. It is this zone, with its specific field of action, which we have called the home of the family.[2]

Defined in this way, the significance of home lies in the specificity, or quality, both of its content and of its context. Home – whether of high specific differentiation or of the crudest pattern – is a quality product. As such it is an entity referable to the

[1] see *Biologists in Search of Material* and *The Peckham Experiment*.

[2] *The Peckham Experiment*, p. 259.

functional co-ordinate. True, it includes all those material factors by which we are accustomed to assess a home; but they are incidental to the qualificatory attributes accruing to it from the functional action of the family.

Viewed thus as an entity of quality, the family-in-its-home might be seen as not unlike a poly-nucleated cell which, through its specific cytoplasm, is engaged in transactions at its periphery with all the other cells in the body of its inhabitation. Using this analogy, the poly-lobed nucleus would represent the individual members of that family – parents and children – immersed in their specifically patterned cytoplasm – the functional home. Just as a simple cell in the physical body grows and differentiates under the influence of its nucleus, so the family in its home is no less a live entity with the capacity to grow and to differentiate, progressively inducing about it a specific patterning derived from its potent nuclear core – the persons of that family. While quantitatively homes expand; qualitatively they *grow*.

The specifically patterned zone – the home of the family – extends to all things, situations and events with which its members are able to establish personal relationships. Hence a home can – and in functional existence does – reach far and wide into the environment; it may well extend to the antipodes, or in our day into space or to the depths of the sea. The family's home can be as confined as a bed and a bare hearth; or wider than the world – according to the scope of the functional action of that family as a unity of function. The important factor is that within its field of action everything is given specific pattern: 'qualified' by the facultative action of that family organism.

There is no word for such a nexus of specific patterning derived from a central core, protean in its excursion yet exquisitely defined by the specificity of its relationships. To such a functional whole of quality, we shall refer as an *ethonological whole*.

Once material of whatever sort is introduced to the social territory of the family, in functional action the home acts upon it like a 'social stomach', sorting and analysing the food that impinges on its periphery for family digestion. Indeed, the home might almost be regarded as a family 'gut', determining the *quality of utilisation* of every sort of 'nutrient': accepting this, rejecting that, metabolising the intake and giving to all that is

incorporated the stamp of the group-specificity of that family. Through this synthesis carried on in the home all experience is '*familiarised*', i.e. rendered congenially specific for each of the persons within that family.

It must not be overlooked that the home, like the gut, has power to reject unsuitable material, i.e. material not apposite to the functional needs of that family, as well as to receive, ingest and congenialise suitable material. The child is as aware of what is rejected and of what is passed by, as of what is acceptable in the home – a point often ignored by parent and by educationalist alike. The home may, of course, be subject to pathological disorders, so that pathological reaction is never excluded as a possibility. In those circumstances, the home may let the foreign substance through the barrier, and the 'body' of the home may then proceed to react in inflammatory or allergic process in both personal and social aspects. Indeed, we know too well in terms of social pathology and psychopathology how a family constitution rendered 'allergic' in this fashion, can even be transmitted from the old family to the new; just as physical proclivities may also be carried over from one generation to another. 'The parents have eaten of sour grapes and the children's teeth have been set on edge.'

## The Cultural Nature of the Home

In the economy of nature approach to the alien outside world is step by step a 'live' and growing one; i.e. a *cultural* procedure. But that is to use 'culture' in its biological sense. This cultural process can be followed readily in the progression of the newborn infant into a family acting as a functioning whole. In the midst of the home, the newborn in mutual action with its mother finds ready to hand highly individual provision for its needs. First in importance is its physical food in the form of its own mother's milk secreted from material identical in specificity to that on which it has hitherto fed and grown its body in the womb. The milk, a substance suited to its needs, is of a quality the infant already subjectively 'knows' and 'likes'. It has not only a smell and a taste it recognises; it is patterned specifically according to the metabolic mode the infant has already grown

by in the womb. And about the hearth as it grows it encounters the family occupants with whom it shares the same group-specificity. Indeed, all that it meets here – things, sounds, smells, voices, faces – are by no means wholly strange to it; even the family friends admitted to the home, particularly at this time, are those acceptable – congenial – to its family. At ease among kith, and in so kindly a situation, the newborn is at once 'at home' – and home is a place where we know our way about, are free to act as we 'like', according to our 'feelings'.

Here, then, the infant has arrived into a functional field where it is instantly free to meet its personal needs – *eclectively*.[1] In its earliest questing it can pick out, 'choose', that which is akin to what, within the womb, it has already come to 'love' and to 'like'. It gathers not only new 'sensations' but in the progressive exercise of its 'choice' also acquires new 'feelings', so keeping its 'yolk sac'[2] – its own internal environment – replenished with new feeling-content. In a congenial environment, without break in continuity, it directs its working programme qualitatively in the biological order of specificity – according always to its own internal bias of sex.

It is in these ethonological circumstances that the young may learn *how* to *choose*: how to align themselves to an ever-widening environment, wherein continuously that which is initially foreign to them will be encountered, familiarised and digested. They are in a position to act eclectively in every new step they take in mutual synthesis with their congenial surroundings, so progressively gathering their own specific homologised content. Here then is a setting presenting a functional medium for the *cultivation of the feelings*, with which we shall be deeply concerned later.

It is not, of course, only the immature young of the family for whom the home provides the field proper to eclectic action. All eclectic action proceeds in a field of congeniality: i.e. consists of choosing from the group-specific that which can 'mate' with the individual's homogenially specific content – so producing further differentiation of that content. This applies alike to the parents and to the children within the home.

Just as in the physical body the individual cell is not only

[1] Chapter v, p. 57. [2] Chapter viii.

qualified by, but also qualifies, the body of its inhabitation, so the home – through its specific progressive differentiation – comes to pattern the wholeness of its total situation, qualifying the comity of the family inhabitation; civilising its polity.

Home, a zone of congeniality, is an entity of quality having neither geometric nor dynometric defines. It is a functioning *unity*, the measure of which is ethonometric and only to be described in terms of specificity. We are not here dealing with an entity that can be understood in materio-dynamic terms. Home is essentially a quality product–whether of high specific differentiation, or of coarsest texture. As such, it can only be understood in terms of the functional co-ordinate. Sociology – as distinct from social pathology – cannot become realistic until the qualificatory potentiality of *home* is grasped.

The processes we have been describing may well be without significance in any quantitative estimation of the growth process. Taking a purely materialistic or rational outlook, it may be difficult to assign any attributes to the 'home' other than the bricks and mortar and the material appurtenances of the house. Provide these and you have 'built a home'. Both common experience and scientific and/or political experiment demonstrate that young can be born and populations can increase in these circumstances. Population increases can occur and be assessed in these terms alone.

But from the qualitative point of view there now appears a potent reality of a different sort. Apart from the significance that this qualitative reality has for the development of the faculty for genesis, these qualitative circumstances may well turn out to be of general importance, constituting a factor necessary for the emergence of bionomic order in society.

## Development of the Faculty for Genesis

The initial sex endowment of each individual is determined by the presence, or absence, of one particular gene in the chromosome system, so that the foundation for the faculty with which we are here concerned is laid down in the individual at conception.

So beautiful and exact is the work that has been done to

establish the role of the chromosome system with its contained genes in the creation of the new entity, and so well known has this work become, that there is little need for comment here. Suffice it to say that in essence the chromosome system is a structure of paired elements, each of the pairs representing a diverse specific endowment from the male and female sex cells of origin, which by mutual mutation of the component parts, gives rise to a synthesis of novel genetic pattern. The same theme again – the bipolarity of functional action issuing in creative synthesis.

The fact that the fusion of two chromosome elements, or even of individual genes, can be made to occur in the laboratory, must not be interpreted as licence to ignore the necessary complement of this process in bionomic order: i.e. the significance of their context in functional action. In nature, the apposition of the diverse chromosome complements is preceded by an ordered pattern of behaviour of the mating pair and by specific environmental circumstances in which the pair move to the event of mating. The protracted courtship of the scorpion, the swarming of the bees, the courtship of animals and birds, to say nothing of the often unaccountable behaviour pattern of the courting human species, are examples enough of the intricacy of the circumstances that precede and enhance genetic synthesis. There is yet far to go to understand the functional significance of the concurrence of a patterned environmental context with the fusion of the content of the diverse chromosome elements – in natural circumstances.

Accepting, then, the chromosome system with its idiosyncratic sex gene as the structural basis for the faculty for genesis, and recognising its ethonological setting, we can now look at the development of this faculty as a two phase process:

(a) development of the internal faculty as seen in the immature individual in relation to his or her family of origin;
(b) development of the external faculty as seen in the two presumptively matured free-moving parts, male and female, functionally integrated as a whole – a new family growing a new home.

## 2. THE INTERNAL FACULTY FOR GENESIS

The development of sex, both in the male and in the female, begins as a purely endocrine faculty. It is well known that in the early period of development in infancy and childhood the endocrine expression of the sex endowment of each is engaged in the direction and balance of the growth and differentiation of the body structure, thus giving to each his or her physical bodily aspect of maleness or femaleness.

In the immature individual, male or female, the expression of sex is through a 'bias' rather than through a rigidity of structure. This is clear, for cocks can be changed into hens and vice versa; and in the human species, pathological process can produce strange freaks both of persons and of personality. There are girlish boys and tomboy girls; hairy females and breastful males: all aberrations of the endocrine function of sex development. The expression of sex in the individual is thus not an absolute; it is largely dependent on the context, i.e. the conditions in which development occurs.

It must be borne in mind that every single biological entity, even a single cell, is an example of the duality of sex; all are bi-sexual. This bi-sexness, whether in the nucleus of a cell or in the body of the immature male and female person, or in the organism as a functioning whole, issues in the creation of novelty. Even the cells of our bodies – bi-sexual entities with their dual chromosome content – are continually producing progeny in the process of growth; in further differentiation of their content as well as in the maintenance and repair of tissues. Cells do not merely multiply; they are also able to develop and to differentiate. In the course of a lifetime, an original individual has developed into many seasonal individuals – each of the many, novel and unique.[1]

A female individual is, then, in herself a bi-sexual unity with a 'bias': i.e. she moves in a field of function biased towards femaleness; a male individual in himself is a bi-sexual unity with a 'bias' towards maleness. It is shifts in the bias of this inherent bi-sexuality of every individual, that account for the possibility

[1] Appendix 16.

of feminising the male, and vice versa – and of experimentally or artificially inducing such disorders.

## The Nature of Bias

This brings us to look more closely at the principles that underlie 'bias'. The simplest example of this is to be seen on a bowling green. The 'woods' are, to all intents and purposes, of identical nature; but the weight within the wood is so disposed as to cause the bowl to roll to right or left, describing an arc and not a straight line in its passage. The curved motion of the bowl is due to an *inherent* bias; but the surface of the green, the pull of gravity, etc., i.e. the general environmental circumstances, are still significant in the course it will take.

Bias is not always inherent, or contentual, as in the bowl. It can be *adherent*, or contextual: i.e. impressed on a body from outside – as in billiards. The player, by giving 'right' or 'left' side to the ball, can make it arc in its horizontal course. This adherent bias given to the billiard ball is due to *particular* external factors imparted to it by the player; but, like the bowl, this ball is still also subject to the general environmental influences, surface of the table, gravity, etc.

Bowls and billiards are similar in that in each case a single bias is exerted; the balls are unipolar. There are other balls, e.g. the rugger ball, which being oval have equivalent centres and thus bipolarity, so rendering them more readily subject to adherent bias.

If now we revert to the question of biological bias, we are confronted with a complication. The biologist has to contend with bipolar material, but *his* model is egg shaped. Such a 'ball' has an inherent inequivalence owing to the inequivalence of its diverse poles. It is open to more complicated internal bias; but also, owing to its bipolarity, peculiarly open to adherent environmental bias, both particular and general, so yielding a full mixture of hazards.

This is the position found in organism. Here the inherent bias deriving from its diverse sex poles is further added to by a multiplicity of factors from the context or environment, giving it further adherent bias. Hence there is introduced a complexity

of motion and pattern due to bias altogether beyond man's conscious skill and knowledge to control. Yet – and we must not lose sight of so conspicuous a fact – the functioning organism, involved in just such complexity, in action manifests biological order.

In the immature male and female, the bias of sex is clearly not just a mere bias of physical dis-similarity, for the facts point to a relative identity in the physiological (operational) capacity of the two sexes in immaturity; at least up to puberty, each – in his or her measure – can do all that the other can do. Hence the bias due to the internal faculty for genesis is not a bias recognised in physical science. The female is not either so much less or so much more male, or vice versa. The diversity is unrelated to any absolute of physical science. It is a functional absolute; one not yet studied. Here again the functional co-ordinate is necessary for its recording.

The principle of functional bias can perhaps best be appreciated in the process of secretion. Excretion and incretion at any surface are balanced by an intervening membrane. This membrane, itself functionally active, acts as a *mobile fulcrum* giving bias, so that in the process of incretion and excretion the balance is to one side or to the other. In functional action the *position* of the fulcrum is every bit as important as the nature of the increte or excrete. To give a simple example: food in the stomach does not guarantee its undergoing metabolic transformation in the body. The bias of the fulcrum, the secreting membrane of the stomach, may be set against absorption. In all synthesis in functional action, this factor enters into the 'how' of utilisation.

So in general terms it might be said that functional 'motion' is of *trinitarian initiation* – the two diverse factors on either side of a fulcrum and the fulcrum itself being the three factors in the trinity of action.

In physical assessment of bias, use is made of units of measurement which in themselves have no bias. But no such form of quantitative measurement, geometric or dynometric, can identify and assess the events deriving from diverse polarity in the field of quality. While, then, we are in no position directly to assess or to measure the bias of sex in the immature, we still can observe it in action.

## The Inherent Bias of Sex

Throughout infancy and childhood, the internal faculty for genesis is engaged in, and presides over, the bias of growth and development both of substance and of the personality of male and female, giving to each the characteristics of masculinity or of feminity. Being in this first phase an endocrine faculty, in each individual the stir to action is directionally from *within-out*; that is to say, it is unlike the external faculties primarily responsive to external impacts due to sensation. The faculty for genesis in this phase is an internal faculty; it is primarily appreciable as 'feeling'.

In this phase of immaturity, 'sex' as an external feature – though structurally declared in infancy and childhood – is *facultatively* undeveloped; so that the male has no external facultation for masculinity, nor the female for femininity. Environmental impacts reaching the child through sense-reception do not lead to expression of feeling or action associated with the external sex faculty. Exceptions of course may occur in pathological circumstances, either in the child or deriving from the society in which the child is immersed.

Any difference in action observable in the two sexes in this phase of immaturity can tentatively be attributed to a 'feeling' of maleness in the one and a 'feeling' of femaleness in the other – but this is something quite other than that which is commonly called the 'sex-sense'. To the observer, viewing the child in its family context, it is the bias that each – male and female – displays in the doing, rather than what either can achieve, that stands out in their respective action-patterns.

To say that the individual is biased does not, of course, give an adequate picture of the sex directionality, for the bias resulting in facultisation is not any 'linear' bias. In the male it is, as it were, axifugal – *out* to all directions; in the female it is axipetal – *in* from all directions. Thus we find that the male bias – seen, for example in the interest the boy evinces in the situation around him – leads him to turn his attention to transactions at the external environmental threshold of intake; while the female bias leads the girl to transactions at her own internal environ-

mental threshold, that is to say, in relation to her own personality. So, while the boy child tends to 'materialise' experience gained from the periphery, the girl child tends to 'personalise' it – from within. This tendency of the internal bias in the sexes continues throughout life. Maybe society, in accepting the contemporary view of the 'equality' of the sexes, has unwittingly foregone the personalising, i.e. 'humanising', of all experience that derives from the inherent sex bias of the female in the mutuality of functional action. The female pole has been in disuse – a 'lazy eye' in social polity; or, when used, has been disciplined to use as a male eye.

So, though immersed in the same familiar context from the moment of birth, each encounter to which the male or the female is eclectively drawn leads to a different synthesis in each sex. Their respective methods of *utilisation* of the available material are different. But, as we have seen, utilisation is a qualitative factor – the *how* of doing. The internal bias deriving from the faculty for genesis acts on the qualitative factors of the context presented; not on the quantitations involved in what is achieved.

In action, this bias is primarily appreciable in the difference in approach to what will be done; it is the nature of the approach to action which 'colours' the picture of sex differences and which yields the difference in action-pattern of the sexes.

## Adherent Bias in Sex Facultisation

In considering the development of the faculty for genesis in the individual, it is not enough to be concerned only with the internal bias given to each male or female by the genetic sex complement of genes in the germ cell of origin. As the immature individual develops he is being influenced by the particular *adherent* bias to which as a sexed individual he is exposed.

Immersed from the moment of conception in the maternal body, i.e. in the patterned group-specific matrix of the parental environment, the infant at birth, as we have already seen, is ushered into an intimate environmental field of function dominated by a congenial pattern of group-specificities. He is not precipitated, as it were 'naked', into anonymous, common and un-differentiated environmental circumstances; not born 'blind'

into a strange world according to the sentimental picture. He is born into an environment of which he already has prescience – owing to the consistent congeniality of its patterning; owing to its quality.

Hence the sex bias derived from the inheritance of a specific genetic endowment will, from the moment of conception, be played upon by an 'inheritance' of particular environmental circumstances – those of the home – equally specific and equally ordered as we have seen. In the case of the faculty for genesis this factor – that of the *nurtural inheritance* of the child – rises into prominence as an adherent bias able to modify the internal bias deriving from the genetic sex inheritance.

We cannot begin to understand the development of the individual – still less that of the sex faculty in that individual – until we have grasped that there are two factors in inheritance – genetic and nurtural.

Owing to his internal sex bias, all experience that comes to the male child is viewed from a different aspect to that of the female child. Thus as he acts in unity with the family, the home as a whole is tinctured with his view. So the specific content of the home – of which each child is a part – is changed in quality. That change in the home, affecting all the members of that family, will in turn again be subject to the respective bias – male or female – of each other child in the family, so further diversifying the subsequent action of each child and of the family. The impact of this process is progressive and specifically differentiating throughout the whole inhabitation.

It is no more than a matter of common knowledge that the presence or absence of male and/or female children respectively changes the whole aspect of the home. In our terms, it changes the ethonomy of the whole. It is also a matter of common knowledge that the attitude of parents to sons and to daughters is different. That being so, it is clear that that difference must constitute an adherent bias in the growth of the boy or girl.

In the infant and young child, it is readily appreciable that the direction of its action derives from within: from the 'feelings' accompanying eclectic action. This, however, is no easy field of enquiry, for means of assessing the feelings are at present wholly unsatisfactory. There are yet worse snags: we have seen earlier

that functional needs are fulfilled eclectively in the bipolarity of action of within-out/without-in; of feeling/sensation. Unless the congenial specific quality of the home – exercise ground of the feelings – has been developed, and unless the child has been free to act eclectively within that home, his feelings are likely to have remained largely undeveloped. In such a case, where the child may be said to have been functionally starved from birth, the feelings progressively shrivel. While, then, the quantitations involved in the growth process may appear, and be assessable, qualification arising with the infant's gathering feeling content stagnates at a functional minimum. Hence appropriate material for experimental study of functional action is not available.

But, as we have already seen, where the young are born into a functioning family home, in its specific congeniality there is already awaiting them at birth and persisting throughout childhood an affectionate basis for the progressive development of the internal facultisation of the 'feelings'. In such a home an appetite for living grows, and love is bred.

It is in the kithly medium of the home that the young of all the higher species are spontaneously gentled and progressively find their orientation for living. Here there is to hand 'familiar' group-specific material provided by the parents: material which they contribute to the child – like the 'white' of the egg contributed by the hen to the embryo chick. Within that congenial home and from its congenial material, the young are free progressively to exercise their own choice and to gather their own content of homologised material – their 'yolk'. From such qualitatively diverse sources they draw the material out of which to grow their 'individuality' – according to the dictates of an internal bias derived from their genetic inheritance.

It follows that the unfolding in the child of the inherent faculty for genesis can only appropriately be studied where, not only is the home open to observation, but where that home itself is functionally active and growing, so allowing the spontaneous growth and differentiation of all its members. This can only happen where the context of the home is one of a 'live' and functioning society.

## 3. GENESIS FULFILLED: THE EXTERNAL FACULTY

1. *Adolescence.* The transference of the faculty for genesis from an internal into a dual internal and external one at puberty, is an almost dramatic event. As the hitherto purely endocrine expression of sex in the individual burgeons forth in external expression, there begins a process not unlike that of a metamorphosis. The transformation is as striking as are the changes in a tadpole which, acquiring the lungs and legs of a frog, invades dry land; that is to say, moves into a new environmental medium.

The immature male or female child has been splendidly enfolded in the congenial specificities of the home, there exploring the use, and elaborating the content, of his or her bodily endowment. Here, before puberty, there has been progressively enacted the primary facultisation of the structural features of the body,[1] while the faculty for genesis functioning from within-out has been directing the balance of growth in the body and of the person.

With the emergence of the faculty for genesis in its external expression at puberty, there begins a movement from the home pond; the excursion of the boy or girl rapidly and progressively increasing both physically and mentally as each begins to circulate independently in the general social terrain.

Meanwhile, exfoliation of the external genitals is occurring simultaneously, and only accompanying this further development do the means of facultisation of the external faculty, commonly regarded as the 'sex function', become available.

Whereas with all other features of the body the *means* for facultisation are present at birth,[2] in this case though the anatomical disposition of the special sex organs is laid down by birth, the emergence of the physiological means to function is delayed until puberty. By this time the bias to maleness or femaleness has been set through the endocrine influence of the internal secretion of the sex glands. Nonetheless, as with all other faculties, discriminate facultisation of the faculty for genesis in its external expression still has to be acquired after both the anat-

[1] see *The Peckham Experiment*, Chapter XI, pp. 182-3 [2] Chapter VI, p. 70.

omical and the physiological capacity of the sex organs are fully developed. This is no short or simple process, nor is it one which in the early stages of facultisation revolves round the external genitalia alone. It involves profound change in the *whole person.*

Concurrently with the physiological competence of the external genital organs, there begins to appear at puberty a high degree of sensibility – a very special *sex sense* – of the environment. The sense we refer to here is of a *general* character, not one focused upon the local development of the genital organs. It is important to recognise this, for without this distinction it is impossible to grasp the deeper significance deriving from the full development of the faculty for genesis in adolescence.

The *general sex sense* that arises at puberty heralds an awareness of sex as an all-pervading factor colouring the world of the grown-ups. This is an aspect which has so far not arisen with any acuity into the immature child's conscious appreciation. Becoming aware of the bias sex gives to *all* action in the adult world, there comes upon him now an urgent need to penetrate and to understand this aspect of experience and to find his own orientation in respect of it.

Vague though it may be, the urge upon him is forcible, though its expression is as yet without all nicety of competent action. Thus unfacultised, it is apt to emerge in the gawkiness, abruptness, waywardness and in the emotional disturbance so well known in adolescence.

With this new general rather than localised sex sense, the immature male or female reared throughout childhood in the familiar circumstances of the home, begins to explore the wider and unfamiliar social medium around him. In his penetration of this medium he is powerfully swayed by his own now well-established internal sex bias. So, though at first tentatively, his new approach to everything now becomes consciously – or maybe unconsciously – that of the male, or female, as the case may be.

This wider freedom of movement into a new social terrain should not be understood as a purely personal adventure of the adolescent himself absolved from the patterned environment of

the home with which he has up till now been so intimately associated. The boy or girl at puberty cannot escape from the ethonological whole of which he is a part; does not, cannot, shed the group-specific configuration of the home of his origin. Like the chick in the egg, he has 'fed' upon, grown and developed from the substance of the parental contribution in that home, of whatever quality. That – like the 'white' of the egg within the shell – has been a patterned, specific contribution. While, then, though physically released from the home at puberty, he inevitably bears with him the specific imprint of that home.

It is not, of course, here implied that the pattern of action derived from the home remains with him as a static figure. As the adolescent's growth proceeds, that pattern is profoundly modified according to the degree of development that ensues: it become further differentiated in specificity; more defined and precise with the increasing discriminative quality of the individual. The changes that occur at puberty are peculiarly powerful in inducing just such qualitative development. The faculty for genesis, as we shall see later, is perhaps one of the most powerful factors in modification and elaboration of further and discriminative patterns of specificity in adulthood. But even the potent changes of puberty cannot wipe out the specificities derived from the home: it can only 'grow through' them.

In general terms the outstanding feature of the translation from childhood to adolescence at puberty lies in movement from one environment to a new one. But this translation is by no means dependent upon quantitative factors. The change that occurs is conspicuously qualitative. It is movement from the zone of congenial group-specificities shared by the family, to one of limitless heterologous specificity, from which he is destined to make a qualitative world of his own.

In this transition, puberty stands out dramatic and colourful as a point of departure from one ethonological situation to another yet to come – of wider and deeper experience. Attached by many-coloured 'streamers' – specificities of infinite extensibility – linking him with his home, the individual at puberty draws out from the home shore as a ship from its moorings;

slowly, tentatively at first, gathering speed as with sureness he finds his own direction on the open seas of experience.

There are many phases in the adolescent process as there are, for instance, many phases in the infant's process of learning how to walk. Owing, however, to the progressively deepening and widening range of his excursion, these phases can only become apparent to an observer to whom an arena offering the wide and various opportunities for action now becoming desirable to the adolescent, is open to continuous observation.

The Peckham Experiment revealed that this arena must be a social field presenting diversity of opportunity. This does not mean merely one including, and providing occupation for, adolescents of both sexes. It demands a society of individuals and families themselves in *every stage of maturity;* themselves engaged in a wide diversity of action. Such a field must thus be one in which all ages find apposite material for their *own* respective interests and in which those many and varied interests become spontaneously synthesised into a social whole, or community, in which the *adolescent freely shares without undue attention being concentrated on him at this period.*

Observation in such circumstances has confirmed for us that from puberty onwards the young adolescent boy is above all and first of all, concerned to be a 'man'; and the girl to be a 'woman'. What are the implications here?

First, is the urge *to understand the adult world;* more particularly in its general sex implications of which the adolescent has now – however vaguely – become aware. Though he may well have been taught the 'facts of life' he is still a stranger to the 'feelings' of living in the adult world.

Second, is the impulsion, now stronger than ever before, to exercise his or her own choice in all that is done. In terms of functional action this means the urge to act 'eclectively' in pursuit of all that he does. He is moving – 'feeling his way' – to the development of his own individuality; setting out to extend his own field of homologous specificity by that which he himself picks out from an environment of heterologous specificities he is now beginning to penetrate.

We have already seen, in discussing the faculties in relation to the mutual synthesis of functional action, that eclectivity

involves the feelings. It is well-recognised that adolescence is a time of emotional upsurge; a time indeed, when the turbulence of the feelings rising to the surface may even temporarily stay all action.

This heightening of the feeling content emphasises and colours every item in the panorama that is unfolding before the adolescent, giving to every thing, situation and event a new aspect and a new vividity. Along with this surge of the feelings and the accompanying pressing urge to choose for himself in the new world opening to him, there emerges the impetus to a *new orientation of the use of all the primary facultisation* he has acquired in childhood.

The metamorphosis at puberty ushers in a relatively long apprenticeship of eclectic choosing exercised on every aspect of the adolescent's life. During this phase the male and female – immature though they still be – are reaching out in every direction towards the fullness of their own maturity as persons – knowledgeable and competent in the world they live in. This world has for each an all-pervasive qualitative as well as quantitative significance – new meaning for them. Material provision alone – no matter how lavish – will not suffice the developing individuality in this phase.

There is a still further point of deep significance. It is upon the niceness and precision of the exercise of eclectivity at this phase of development, that there hangs the choice of how the individual will use all his faculties; those he has developed in childhood and those he will henceforth develop. Here is involved not merely the choice of a life's work suited to his potentialities, but also the strength of the appetite, vigour and creativity that he will bring to whatever contribution, consciously or unconsciously, he is to make to society.

Still more is facultisation of the general sex sense of profound importance when it is recognised that on it depends how that individual will be equipped with discriminate feelings to choose the mate through whom he may fulfil his own potentiality for qualitative action in every sphere in adulthood.

Only after an apprenticeship of extended duration do the young come to the position in which – senses and feelings developed and in balance – they are functionally equipped for

mating. The duration of this apprenticeship is related directly to the degree of differentiation of the species concerned – in the life cycle of man, longer than in any other species.

11. *Courtship.* So important would the principle of action in a bipolar field of unity seem in biological economy, that in the case of the faculty for genesis – upon which hangs the perpetuation and differentiation of the species – the pair concerned in the creation of a new organism is, as we have already seen, represented by two separate free-moving bodies: the male and the female of the species.

The inauguration of the mutual association of apposite diverse sexes into a new organism, or family, is commonly heralded by the process of courtship. Courtship yields one of the most obvious and defined action-patterns in the life-cycle of the organism. In man it is a distinctive process: of it he is well aware; with it he associates the feeling or emotion called 'love'.

That, however, does not take us very far in understanding the process. 'Love' is a highly equivocal term. In its use and abuse it is open to confusion of meaning – even in common parlance. So much is this so that the inevitable tendency is to avoid use of the word in any technical context. Evasion of the issue, however, is impossible for the student of functional action, for the process and its outcome underly many of the major manifestations of living.

Seen from the functional aspect, courtship represents progressive stages whereby two free-moving persons of specifically diverse constitution are in process of coming to act in mutuality of synthesis in a field of unity. It is a process of peculiar importance for the observation of functional action, for it presents what might be regarded as a 'slow-motion' picture of the initiation of the process of mutual subjective synthesis.

Here we must go back on our tracks. In mutual subjective synthesis we found evidence of an urge or attraction between diverse but apposite specific entities inducing fields of unity from which new specific wholes arise. To this emotive phenomenon we have given the name eclectivity.[1] It was necessary to do so

[1] Chapter v, p. 57.

because this potential for action in a field of unity is not reconcilable with the behaviour of energy as known to the physicist and so does not appear on the materio-dynamic co-ordinates where all known energy factors are recordable.

In courtship we are presented with the actional evidence of a major 'charge' of eclectivity. The action-pattern – 'falling in love' – is that which accompanies the closing of a 'live' circuit of the 'energy' potential of eclectivity in the quick and living universe. Perhaps no more readily appreciable example of the passage or 'flow' originating with eclectivity could be cited.

When a major charge of energy emerges as mechanical power we are impressed with the magnitude of its effect; but when the 'energy' associated with eclectivity finds expression through the functional action of organism we are apt to pass it by as a commonplace. Yet in the process of courtship, to see the fierce dynamicity of eclectivity that leads to mating transforming the male adventurer into a male inventurer, and love come to nest, is like watching a fiery furnace in which smelt becomes a melt in the crucible – to turn again to tempered steel. From smelt to melt – with all its possibilities for creative action.

Fired by the eclectivity of courtship, in the living crucible the physical change from smelt to melt is duplicated in both male and female. Through their inter-action in the heat of the crucible, each becomes changed, as, emerging like some of the strange amalgams, they fill each other's interspaces – eclectively. Not only do they become functionally different, but even different physiological entities.

Each complement entering into a field of unity carries its own 'charge' of eclectivity. In the field of unity the affect is spontaneous – throughout the whole. This we have already seen when discussing the process of mutual synthesis. It is in the spontaneous action throughout the whole that the participants are mutually mutated. The change is in the pattern of specificity; conspicuously a change in quality: one that originates new quality. Unlike all forms of energy known to the physicist, here there are no sequential values; only qualitative values pertaining to wholes. But wholes have not come within the ken of the physical scientist; nor do we yet know in what dimension they might become recordable.

In this change the basic and unique character of each is in no way obliterated. On the contrary, in the mutuality of the process each achieves further specific and unique differentiation of individuality. This transition too is unlike that due to any form of motion known to the physicist. For instance, in any chemical synthesis elements retain their elemental characteristics unchanged throughout any reorientation they may undergo; whereas in the functional synthesis of biological entities an irreversible change in specific content of each participant arises with each new functional orientation.

It is well known that in the courtship behaviour of birds, the billing and cooing, the posturing, the twig-offering, etc., represent involuntary mechanisms into which powerful hormonic activity enters, so preparing each of the mating pair for the full process of parenthood. Courtship, the incipience of mating, is often associated in the female with a well marked period of maturation of the ovum; of the sperm as yet nothing is known, possibly because the changes may be of dynamic rather than of chemical nature.

We must then expect courtship and mating in man also to be accompanied by measurable biochemical and biophysical changes to be found on the materio-dynamic co-ordinates. A wide field for physiological investigation is to be anticipated in association with courtship and mating.[1] For instance, in each successive change in the mutual mutation of the pair, material evidence of such changes will probably be found registered in biochemical and biophysical events occurring at the internal threshold of exchange of each complement engaging in mutual synthesis. Here, however, we are concerned with the initiatory qualitative events in the process of courtship upon which such recognisable quantitative events in the physical field may follow.

So important would this process of the specific complementation of sex diversity seem in nature's economy, that in spite of man being the least tropistic of all species; i.e., the least automatic in his actions, nevertheless the initiation of mating – 'falling in love' – still remains an involuntary autonomic action beyond man's voluntary control. Though beyond his wish or will to induce, he can say nay to its fulfilment. It is curious

[1] Pioneer Health Centre. Research Programme, 1949.

that when the same autonomic wisdom that keeps our hearts beating and our lungs breathing, intervenes to shape the major pattern of our lives, we – taken by surprise as though blind and tripping over some obstacle in our path – say we have 'fallen' in love. Yet though falling in love appears to be completely autonomic, strange to say in health and sanity the instinct is not blind, but clear-eyed and of critical vision.

The relatively long apprenticeship during which the general sex sense is becoming facultised in adolescence, has led to the development of discriminative capability. It is this progressive ordered unfolding which prepares each person severally for the discriminate choice of a mate. If the meaning of sex in its fullness has not arisen through prior development of the *general* sex sense we have previously referred to, the choice of a mate is liable not to have the necessary qualitative values to permit of the establishment of a functioning unity.

In health, through the development of his general sex sense the male comes to recognise that his need is not for females; it is for a mutually eclective female who can utilise him and be utilised by him in mutuality to further the maturing of his maleness as a whole; and vice versa. Thus to the highly specific male, females are either alien, group-specific or individual-specific. Females are even more instinctively and intuitively 'eclectic' in their action – possibly because of the cumulative periodicity of their physical constitution. So, seen from the aspect of functional action by which progressive differentiation of specific characters arises, the manliness of adolescent celibacy and the womanliness of adolescent virginity are no mere ideal of moral philosophy. They are evidence of bionomic order of the progressive specific maturing of each individuality, thus preparing each for fulfilment of the potentiality of the faculty for genesis in the organism as a whole. It might even be said that the 'individuality' – i.e. the full specific quality of the male or female person – is but potential till mated, becoming actual only as the fully grown man or woman finds an apposite mate. Though both persons are of unique specificity, each in functional action leaving his 'finger-prints' on all that he does, nevertheless the full functional picture of the individuality of each is still to be limned. Only when he (or she) as a single free-

moving form finds a context apposite to his own content, can his own individuality mature in the patterned nexus of an ethonological whole.

Where, then, in the person, the facultisation of sensibility has reached a high degree of discriminate development, fastidious attention to the appositeness of specificity in mating follows as the functional means of enhancing his (or her) individuality.

That is the personal aspect. From the evolutionary aspect, high specific eclectivity of apposites, leading to further and further specific diversification, would appear to be the means of furthering the genius of the species.

So in terms of function, 'falling in love' is a manifest of nature's sieving process for choosing, from among the many specific diversities encountered, a contextual complement of specific and apposite quality; and the courtship that follows is nature's method whereby each of the pair may progressively homologise the heterogeneity of its new context in a qualifying field of unity.

Each person, or unique entity, has his or her own specificity which is in a measure heterologous to that of every other individual. Though, then, each may find in the environment a context which is apposite – i.e. of analogous or congenial specificity – the new context acquired still has to be homologised by each of the pair in the field of unity they create. This process of homologising heterologies by no means only refers to the physical bodies of each of the mating pair. It pervades and dominates the total situation into which they may move. This we have already seen in discussion of the nature of home.

There is at present a dismaying lack of knowledge of the bionomics of the whole of the field commonly called that of 'sex'. In a civilisation in which the cultivation and exercise of the feelings has been in discard in favour of the education of the senses, and where the individual has largely been conditioned to discount his feelings,[1] it is little surprising that their sudden powerful upsurge, e.g. as at puberty, or in 'falling in love', should all to often emerge in bewilderment, frustration and disordered behaviour patterns. Indeed, this would seem almost inevitable in the face of the general lack of understanding that

[1] Appendix 17.

prevails. Hence, if in contemporary society we do not in fact commonly see evidence of the fullness of functional action, do not see conspicuous evidence of mutual synthesis, either in courtship or in marriage, that should not deter us from appreciating the full functional potentiality of the sex faculty.

III. *The Family.* From the process of courtship there arises *family:* a new organism of the species. It must be emphasised again that in approaching its study, we are not dealing merely with flesh, blood and bone. The constitution of the family is not merely of males, females, children, relatives, for – as we have seen – its biometrics have to be resolved in ethonological terms; i.e. in terms of quality.

In the ethonological field of function, the family moves at ease. As the mated pair grow in functional unity, the range of the field of action coloured with their own specificity is continuously being extended so that the ethonological home provides for them a progressively widening field of action of homogenial specificity.

Here we cannot do better than quote from *The Peckham Experiment:*

> The 'home' then is no material fabric: no castle walls set against the impact of society to exclude the world. It is the specific zone of functional potency that grows about a live parenthood; a zone at the periphery of which is an active 'interfacial membrane' or 'surface' furthering interchange – from within outwards, and from without inwards – a mutualising membrane between the family and the society in which it lives. This home has its points of progression, like those associated with the tips of the root hairs or the coleoptiles of the shoots. These are the contact-points of absorption of nutriment for the family and they are set between the foreign and the familiar in the environment.[1]
>
> Just as our own body is made up of cells, so (this) community is made up of homes, whose 'interfacial surfaces'

[1] *The Peckham Experiment,* pp. 239-40

> are absorbing material and experience that is in circulation throughout the whole social body, that body being modified the while by the synthesis of each and all of its component homes.[1]

So the functioning family, as it grows, is continuously reaching out to associate its own specificity in mutual synthesis with other ethonological systems – with other families of apposite specificity in the environment. This is not to forge inter-se relationships with neighbour cells – families – but to seek its own facultisation in mutuality with the body of its inhabitation: i.e. the society or community in which it is immersed.

This specific patterning of the context gradually acquired by the mated pair provides a rich culture bed for the children that are to come. Here we are brought back to consideration of the cultural nature of the home.

## Nurture of the Young

Into this progressively extending ethonological zone – the home – the child is born, born into the midst of what is already congenially specific to him. Immediately, as we have seen, meeting that which is familiar, he finds at hand that to which he is drawn eclectively. With each mutually eclectic action his feeling is stirred and exercised in the recognition and utilisation of what he likes and 'loves'. From the moment of birth, in the home his approach is 'loving' to each new encounter – whether with people or things; so he acquires and develops a zest and an *appetite for living*. The familiar home is the ethonological culture-bed in which love is bred into the child naturally.

In this his first practice ground, he proceeds in the bi-polarity of feelings/senses in unity of action within his inhabitation, the home. Here at once he is in a position to exercise his prime faculty – that for the maintenance of his individuality – by which his action is orientated in his total situation, just as the action of the cell in a body is orientated by and in the body of its inhabitation.

Any other approach to new experience, for the child, is

[1] op. cit, p. 298.

like the puncture of a hypodermic syringe, or other pathological instrument used in emergency to insert substances into the body It is like taking food by subcutaneous injection – to be absorbed only through the inflammation of reaction.

Just as the cells of our body – except by injury – can be approached only through the function of the body as a whole, so in nature neither the individual male nor female in its immaturity can be approached *functionally* – except through the specific pattern of the ethonological family home.

So it follows that while the quantitative requirements of the growing entity may be assessable and can be supplied from a common source, its qualitative enhancement can only emerge from action in terms of the specificity that underlies bionomic order.

In nature, this zonal familiarising of the environment for the first stages of growth seems to be provided for according to the degree of specificity attainable by the species in question. For the fertilised seed of the apple, the soil into which it falls naturally is tinctured, i.e. specifically familiarised, by the presence in that particular patch of soil of its own decaying pulp; the bird is hatched into the family nest and fledged into the territory familiar to its own parents; the eggs of the insect are laid in uncanny precision of 'forethought' in a food store of material of specific quality familiar to its forebears in the process of their development. In essence these circumstances are no different from that of the child born into the hearth of its parental home and nurtured as it grows within the qualitative field of action of its own parents – its own home.

Ethonological entities in the family home are of many varieties. Any thing, situation or event presided over by the individuality of that family and ingested into that home, is an ethonological entity within the family field of function. So not only motherhood, fatherhood, sisterhood, brotherhood, but policemen, motor buses, swimming baths, motor cars, aeroplanes, football matches – in fact every thing, situation and event coming within the eclectic choice of that family – all become qualitative entities involved in the action-pattern of all the persons of that home. Nor are these components of the home like geometric units with mere Brownian excursion within the body

of the family; they all have become specifically related to that family; either in homologous or in group-specific pattern.

So for example a child born to a family in a period of war will find war in its ethonological pattern: not as an alien heterology, but as a familiar experience. So it is possible to see that a motor bus, already a familiarised ethonological entity to the family when the child is born is, for that child, different in *quality* from an invention – say, a spaceship – so new that the child himself familiarises it within his family. A motor bus as an 'inheritance' is not merely environmental in its location: being known and accepted by his parents, it is already familiarised and is of congenial specificity in quality and, as such, is for that child ethonologically far ahead of a motor bus as a material acquisition. In the home into which he is born, subject to this his *nurtural inheritance*, the child has nothing to learn about motor buses: he takes to them as a duck to water. Such 'knowledge', gentle, kindly and kithly, comes to him spontaneously from his total situation; as did the nutriment drawn from his own placental site, or as did the milk of his own mother's breast. And, like that milk, it is the product of the mutual subjective synthesis of producer and consumer – of the gathering individuality of the child and of the individuality of his own family.

So it follows that in nutural conditions the necessity for 'teaching' recedes: for more than half the process of 'learning' – at least up to puberty – is affected spontaneously through the *qualification* of the congenial environmental situation or home into which the young emerge. Facultisation, in the living entity, grows out of its ethonological context; not vice versa as is generally supposed.

Strange indeed is it to realise that in the wisdom of qualitative reality, the child is in fact born that much older than its father. So all father's accumulated treasures become the 'natural' playthings of the child. And this applies to all that father has experienced. How often parents, seeing children play at 'war', say they 'do not understand'. That is not accurate: they play at war because they do 'know' and are not subject to the pangs of indigestion suffered by the parents before the meal could be digested. All experience, be it crude war, or be it the delicate gossamer texture of love – as expressed in every action

in the home – has been presented as mother's milk to them. Whatever experiences the family organism has fed upon, digested and congenialised, have become 'built in' to the body of the new model – rendered into homologous specifics by the process of the child's own growth. And growth is irreversible.

On the other hand, on contact with any unfamiliar thing, situation or event the child has everything yet to learn. As an 'acquisition' it must pass through alienism, acquaintanceship, familiarity, into that of homologous specificity. All learning in the young – even as a technical educational activity – should be of this order. What is offered needs to be 'familiarised' through a field of analogous or congenial specificity. The natural one is that of the child's own home; potent bionomic product of the expression of the fulfilment of the faculty for genesis of its parents.

If experience is not so familiarised, the spontaneity of eclectic action is withdrawn and so mutuality in synthesis is foregone. When the feeling content is unstirred and unused, action cannot proceed in the bipolarity of senses/feelings. The growing child then loses its due orientation in the total situation of its inhabitation and so for it the meaning of action *for living* evaporates. Then the child fails to grow progressively in bionomic order. So arises disorder – affecting both the child as he grows and the society he inhabits.

To summarise, we have seen that the development of the faculty for genesis is basically involved in

(a) the genetic inheritance, i.e. the inherited specific content of each new individual; and
(b) the nurtural inheritance, i.e. the inherited specific context of the individual.

It is in the context – the functional home – that each individual male and female finds the *means* for qualitative development of his or her inherited genetic content, so fitting each for full function as a diverse complement (male or female) of a new organism of its species.

We are still, however, entirely at a loss to know from whence this 'energy' of qualification arises.

In the foregoing review of the unfolding of the external faculty for genesis, emphasis has fallen on a spontaneous dynamic factor, eclectivity, initiating mutual subject synthesis in the male and female complements constituting family. Throughout we have been assuming that the eclectic 'circuit' so conspicuous in courtship and mating, is a 'live' one. That assumption also underlies our foregoing discussion of the family home. Thus what has been said does not refer to situations arising out of any association of the sexes deriving from human determinism based upon social, moral or financial expediency; nor arising out of any intellectual appraisement of mating and marriage.[1] Nor have we been referring to any sex association arising from physical or social disorder, such as eroticism or other pathological disturbances – all of which yield evidence of the behaviour either of compensative existence or of frank disease. These latter can yield no evidence of the functional significance of the faculty for genesis in health.

Moreover, we have been tacitly assuming that the physical mechanism of each of the mated pair can carry the 'load' of a major charge of eclectivity engendered in the 'live' circuit closed by their pairing, and subsequently to be carried forward into the life of the family. We have been assuming that each component part has a valid intact bodily mechanism, so that order and not disorder – physical and/or psychological – will follow from the impact of the closure of the major eclectic circuit.

[1] Appendix 18.

XI

# Senescence-Juvenescence

Evidence of living is seen in what is commonly called growth. Examination of the faculty for genesis makes it clear that growth presents itself in two different and distinct forms:

(a) development of the content as seen in the immature sexed individual;

(b) differentiation through content-context, as seen in the organism as a whole.

More generally, this may be stated as representing two aspects of the whole of energy as it appears in the process of evolution in the bionomic world.

To understand the distinction between these two aspects, some definition is necessary. The terms 'growth', 'development', 'differentiation', are on the one hand apt to be used indiscriminately by the layman and on the other hand to be used differently by different authorities in both biology and pathology. This confusion is made greater because in the general biological approach to the subject no distinction is clearly made between growth of the individual – a part of an organism – and growth of the organism as a whole essentially consisting of two 'parts', or individuals of different sex.

It is clear – though not categorically so stated – that the main preoccupation of Darwin in arriving at a conception of the process of evolution was with the organism-as-a-whole, consisting of male and female. Since the day of Darwin, however, we have come to know that bi-sexuality is a general principle in the living world. Even each cell is of bisexual character. This is recognised in general in the process of the division of the chromosomes to form new cells; though there are exceptions

to this generalisation in some cell divisions. Each individual, of whatever species, is also a bisexual entity. So too, is each 'family' or organism a unity of two sexes.

In nature we are presented with two aspects of the growth process. One depends on the unfolding of the *inherent* bisexuality in the individual: the other depends on the unfolding of the *adherent* bisexuality of the two separate sexes functioning as the organism-as-a-whole.

What is the significance of this difference? The unfolding of the potentiality of the inherent diversity of the individual through what is commonly known as 'growth', leads to that individual growing older and older, the growth process waxing and waning till dissolution occurs. From this aspect the energy of growth is confined to that individual: it does not pass from individual to individual. Here we find a process which is a discontinuous one: a *contiguous growth process*. This process of growing older and older is a distinctive one which needs definition. It might be called senescent growth – or in general terms, *senescence* (to be distinguished, of course, from senility).

On the other hand, the unfolding of the *adherent diversity* in family – the organism-as-a-whole – passes directly from one organism to another in the creation of new organic forms. Out of this energy transaction there emerges novelty: each new form 'newer and newer'. This process, passing from family to family unlike the contiguous growth process, senescence, is a *continuous* one. It might be called juvenescent growth – or in general terms, *juvenescence*.

Let us examine these two processes more closely. Senescence, represented in the unfolding of the biological potentiality of the individual, covers the full range of development; from cleavage of the primordial cell, through regionalisation in the ovum, differentiation of its cells and formation of the full range of the organs of the body; and finally their facultisation. All these phenomena together represent the evolution of the *content* of a primordial germ cell.

How great is the potentiality of the content can be seen, for example, in the lowliest organic forms where, by fission, the cells may repeat *themselves* for many generations until they die out. The profusion of this type of growth, senescence, is seen in

the growth of the tuber, whereby *one* plant such as a potato, can *propagate itself without variation* until the variety of its own content is exhausted. Senescent growth leads to repetition of the same; within its own homogeneity, its holds no creative possibility.

It is this form of senescent growth also that the cultivator takes advantage of in the process of grafting – whereby the senescent process of growth in the new slip can be short-circuited by grafting it upon a fully-grown stock – the phase of fruiting thereby being speeded up.

Juvenescence, on the other hand, is a creative process. It is to be seen in the seeded fruit; product of two fully sexed individuals originally heterogeneous in their specificity. Through their specific diversity, these appositely sexed individuals 'originate' the new. The inherent content of each participant has to acquire a new specifically diverse adherent context before creation of the new and diverse can occur. After the contentual homogeneal specificities of each 'part', male and female, have been elaborated through senescent development, further diversification of specificity is attained by mutual mutation of the specific pattern of the content of both – each thereby deriving a new specific context. Each mating, a peak or wave in the continuity of juvenescent evolutional energy, becomes an 'origin' of further diversification of specificity.

So we arrive at a generalisation.

(a) Senescent growth sustains *propagation* to extension.

(b) Juvenescent growth sustains *creation* to fulfilment.

These two processes together constitute the manifestation of evolutional energy, as a whole.

From this standpoint, a clarification of the terms growth, development and differentiation, can now be reached. The sum total of processes involved in diversification of the inherent potentialities of the content of any biological entity arising in association with its inherent bi-sexuality, should properly be called *development;* i.e. development of the content. The sum total of processes involved in diversification of both inherent and adherent potentialities of any biological entity deriving from its adherent bi-sexuality, or acquisition of a new specifically diverse context, becomes true *differentiation* of *organism*.

There is, of course, no differentiation without development, and no development without differentiation – at some point in the cycle of growth; for, as we have seen, every cell is itself bisexual. Nonetheless, the distinction between the two processes is a critical one, for where action arises from senescent growth alone, or is exploited from that source, i.e. where wholeness is ignored – the cumulative result is de-differentiation and death. It would seem that it does not do to suppress differentiation indefinitely, leaving evolutional energy to flow only through developmental growth: i.e. to foster development of the content alone without reference to differentiation through the context. That way lies dystrophy.

Using the terms development and differentiation as defined above, we can now examine each more closely. The procession of development in senescent growth as a series of contiguates can readily be appreciated. Seen from this aspect, it is as though evolutional energy were parcelled out in a fashion metaphorically analogous to the parcels of energy the physical scientist associates with mass or matter: as though there were 'corpuscles' of bionomic growth energy. But this appearance perhaps may be because we are not yet accustomed to looking into the *general* environment for evidences of the flow of that particular motion of evolutional energy. We may only see it as a static manifest in the individual, because we are not yet familiar with the environment as a quick and living entity.

In contrast, the procession of differentiation as seen in juvenescent growth, passes in continuity from family to family. While then, senescent growth is exhibited in each of the individual members of each family, juvenescent growth arises in the 'parenthood'. The qualitative expression or specific pattern of parenthood is to be found in its home, a biological zone in an established ethonological *continuum*, society. This is so self-evident that the factor of continuity escapes casual observation.

Both processes, development of each individual entity and differentiation of the organism, have a cumulative phase. This cumulative phase in both processes, can be called *growth*. Growth in this sense would represent

(a) the capitalisation of the inherent potential of the individual;

(b) the capitalisation of the adherent potential of the 'parenthood'.

Growth in these terms would then include both the cumulation by the individual of all inherent diversity of his own body; and cumulation by the parenthood of the adherent diversities of its functional or ethonological body; the home.

Seen in this light as representing events involving both content and context, growth would become the general overall term to cover both processes, that of senescence and that of juvenescence seen *as-a-whole.*

Looking at each of these processes separately, senescence – an incursive process – is thus expansive, balloon-like. On the other hand, juvenescence is excursive, dispersive. If evolutional energy is depicted merely in terms of development of the individual as tactitly it almost exclusively is in practice, the biological universe would be a dead end. It would need 'infinity' to contain it; or the 'balloon' would inevitably burst. The inverse would follow any attempt to depict evolutional energy exclusively in terms of organism – as differentiation; the universe would then contract to zero. So the biologist might easily be reduced to the position of the physical scientist – on the horns of a dilemma – an 'expanding' or a 'contracting' universe: which?

In our concept the answer lies in 'the whole' – in which both processes are mutually mutative. Bionomic science, indeed, needs its Newtonian concept; its own expression of g/t. This might read: s/j senescence-juvenescence. Or, it might read p/c; propagation-creation.

The expression s/j embraces the relation of the part to its specific whole – the individuality of organism – so covering the bi-polar action of diverse factors in synthetic mutual mutation in relation to their whole: not in unipolar action, analytically, either in relation to themselves, or to each other.

Senescence and juvenescence have their own form of 'motion'. This is to be seen in the two distinct growth processes – a contiguous and a continuous process – in mutually mutative equilibriation in the organism. The resultant, i.e. the unity or whole of the growth process, is evolution.

The physical dimension, Space-Time, as defined in modern

physics, cannot and will not serve for expression of the bionomic s/j, or p/c. The science of bionomics concerned with the contiguous process of senescence (propagation), and the continuous process, juvenescence (creation), will need its own specific dimensions.

We still have to find the 'dimensions' to which this statement may be referable.

XII

# Automatics and Autonomics

In an earlier chapter[1] we found that a distinction must be made between the operation of a machine obeying materio-dynamic laws, and the functioning of organism which, while embodying a materio-dynamic mechanism, introduces a patterned *order* not recordable on the materio-dynamic co-ordinates. Before, however, resuming our study of the functioning of organism, it is necessary to have some clear idea as to the properties of the organic mechanism through which bionomic order is manifested.

## Automatic and Autonomic Principles in the Operation of Mechanism

1. *Inter-se Relationship in Mechanics.* It is a characteristic of any machine that it has certain parts so related to each other that when any one part moves or turns, the other part must also move or turn; hence whatever one part does the other does automatically – either reciprocally or in sequence. This type of relationship of parts we may call that of *automatics*.

Automatics involves a sequence of reactions throughout the mechanism at points of contact, or within the fields of force of the parts. These reactions in automatics hang upon an *inter-se relationship:* i.e. as between the parts. In all mechanism there is this inter-se relationship of parts; and hence automatic performance.

Science began with study of the sequences and consequences of automatics. Thus in its earlier history we find an exclusive focus on the automatic aspect of the cosmic field of force. Since

[1] Chapter III.

prophecy inheres in automatics, there arose the great prophetic phase of scientific theory. Hence, like a conjuror from under the cloak of the prophet, the scientist produced determinism, predeterminism, causality. Later, from the practical application of the automatics of mechanism, came the great mechanistic achievement of our modern power units as an expression of energy. These power units are typical *automatic* entities – for example, locomotive engines. They are capable of moving fast or slow, clockwise or anti-clockwise, as clearly definable on the materio-dynamic co-ordinates.

11. *Per-se Relationship in Mechanics.* There are serious limitations to the sole use of the principle of automatics in the operation of mechanism. In the early days of the steam engine the practical engineer, mounting the engine on wheels and putting it on lines, found that it could only go backwards and forwards in straight lines. Before it could travel at speed in any direction required, a further mechanical principle had to be brought into play. It was some unsung practical genius who, to overcome this difficulty, invented the bogie. The characteristic of the bogie is that it has freedom to move *independently relative to the chassis* or body of the vehicle.

It is this freedom of the bogie in relation to the fixed automatic engine, which enables the vehicle to move in accordance with the curvature of the rails, thus giving *to the machine as a whole* the possibility of alignment with curvature. Hence the addition of free-moving elements to the fixed automatic elements of the engine considerably extends the scope of the operation of the mechanism as a whole.

It must be clearly understood that the bogie bearing the wheels is not completely detached from the vehicle: i.e. though 'free', it is not 'loose'. Indeed the meaning of the bogie can only be gathered from recognition of its mode of attachment to the power element, i.e. to the body bearing the automatic engine. Here we are presented with a *per-se relationship* of parts to their whole.[1]

The significance of this distinction between the inter-se and the per-se relationship of parts in a machine, is only to be recog-

[1] Appendix 19.

nised in the performance of the machine *in its context*. It is the context that gives meaning to the bogie. Isolation of the machine from its context would render any such distinction in the relationship of the parts of little consequence.

From the machine, then, we discover that the usefulness of a principle involving freedom between parts and their whole becomes apparent only within a given context. So the full study and implication of these two types of relationship will necessarily take us beyond the study of the machine itself into a wider field of study of the *mechanism in its context*.

A still clearer example of 'freedom' within a per-se relationship can be found in the motor car where no lines or rails are necessary. In a motor car the automatic engine is mounted on a chassis, the wheels of which are in some respects free to move independently. In this sense they are 'free' wheels. It is the 'freedom' between the wheels and the chassis which enables the car to travel in any direction; until this condition is fulfilled the energy from the engine can render no road service. In the motor car, which requires no rails for its direction when running, it can readily be seen that the relationship of the 'free' wheels to the chassis brings the car into operational relation with the environment – with which the car as a whole can now co-operate.

But that is not all. Since the possibility of co-operation with continuous environmental change depends upon this freedom of parts in relation to their whole, it follows that the 'freedom' of the whole – within the context of its operation – is implemented through the freedom of its parts, in relation to that whole.

## Autonomy

This important regulative principle deriving from a per-se relationship of parts to whole, we shall refer to as that of *autonomics*. The operation of parts and whole according to this principle results in *autonomy*.

Autonomy hitherto has been defined as *self*-government; but there has always been an equivocal element in that definition, leaving the notion of 'autonomy' – or 'freedom' – open to philosophical discussion. In our analysis of the 'release' given to the

operation of the machine by the addition to it of 'free' parts, it becomes possible to see autonomy as deriving from the per-se relationship of 'free' parts to their whole, the whole thereby acquiring freedom of operation.

So in mechanism there are two types of operation:

(a) *automatic* operation – depending upon an inter-se relation of parts to each other;

(b) *autonomic operation* – depending upon a per-se relation of 'free' parts to their whole.

From the combination of automatic and autonomic relationships, two important factors arise. The first is that, through the autonomy of its free parts linked to the whole, the vehicle or machine has been freed from the *enslavement of automatics*.

The second is that the intrinsic power element – the engine – has been brought into a *co-operative relation with the environment*.

From these two factors, it follows directly that where parts bearing each type of relationship are linked, their operation in mechanism gives to the machine as a whole a third operational factor: *directivity*. This directivity is referable to the *field of operation* of the machine: i.e. to the context. Thus the property of directivity hangs on the regulatory principle of autonomics.

This principle of autonomics is, of course, by no means new in science; though it has not been stated in terms of the relation of 'parts' to the 'whole'. Neither indeed could it have been so stated, for 'whole' is not an entity for which any place has as yet been found in science.

It was Einstein and Planck who, breaking away from the prophetic phase of automatics, tore away the mantle of the prophet and exposed the other alternative principle of autonomics, thereby plunging the scientist into a field of probability and uncertainty. Here we are not concerned with that issue, apart from noting the fact that autonomics as a principle already has its place in science.

What we are concerned to emphasise is that directivity is not a property peculiar to organismal action; as it has sometimes been assumed. More important, neither is it an attribute peculiar to the functionary. Directivity is an attribute of mechanism, and as such is, of course, a property of the *mechanism* of organism.[1]

[1] cf. *Directiveness of Organic Activities*. E. S. Russell, C.U.P. (1945).

## Automatic and Autonomic Principles in the Functioning of Organism

That the two principles of automatics and autonomics, clearly distinguishable in the artificial machine, hold good equally for the natural machine, i.e. for the mechanism of organism, needs no labouring here. The existence of automatics and autonomics in the living entity have long been recognised and accepted, though they are still far from being fully understood and exploited.

It is, for example, the essential inter-se relationships of automatics that have made the investigation of the automaticity of the natural 'machine' – i.e. the mechanism of organism – a relatively easy matter; for parts in inter-se relation can readily be isolated in a way satisfactory to experimental requirements. The physiologist has long been occupied in such procedure with brilliant and illuminating results. So all-embracing has been his examination of parts in isolation, that no known part of the living mechanism has escaped attention. As a result, we are almost in a position to say that we know something of the working of every part of the mechanism available to the functionary. So enlightening and so far-reaching has this type of investigation been, that there are those who conceive that mechanism alone may prove to underlie and, when fully understood, to explain completely the functional potentiality of the organism.[1]

But autonomy in the living organism, though acknowledged and freely referred to, has not hitherto been sufficiently clarified. This was probably inevitable until an essential distinction had been made between the 'all' – the sum of the parts – and the 'whole' to which the parts belong. Were 'whole' the same as the 'all', a summation of the operation of all parts would suffice for an understanding of functional phenomena; for in this case the parts could be examined seriatim with due regard to their inter-se relativities, and a consummation follow. But where autonomy intervenes, the *function* of *no* part enjoying freedom can be understood apart from its whole. And again, on account of the per-se relationship of parts to their whole, the action of

[1] Appendix 20.

the whole can only be understood *in its context* – with which it comes into relation through its free parts. Now, finding that through the per-se relationship of its parts the organic mechanism has the property of directivity in relation to the environment, we can begin to look more closely at the field of functional action peculiar to the functionary, bearing in mind the fact that in doing so we are looking not solely at quantitative operation, but at functional action into which quality also enters.

Here we are brought back to an important distinction to which we referred at the outset of this treatise – the distinction between the sequential *operation* of the directable organic mechanism, and *functional action* associated with the functionary's use of that mechanism.[1] There are many points of view from which this distinction can be appreciated. One, for instance, is that when an automatic engine increases its power-output to meet 'load', the 'load' – directly or indirectly – is the initiator, and the increased power, the consequence, of its operation. All operation of mechanism is thus *post hoc:* either sequential reaction to strain imposed, or response to signal. No matter how finely timed, or even 'anticipatory' – say through some device – the power increase may be, we still have a chain or sequence of events. Thus in the operation of mechanism, any appearance of spontaneity, which we have seen to be a characteristic of functional action,[2] is illusory.

In contrast the qualification of functional action arises spontaneously; both participatory in and mutual throughout *the whole situation.* As in the case of the driver and the motor car, function supervenes only in the presence of a functionary inducing order through a creative synthesis deriving from subjective 'motivation' in mutuality through the whole situation. Though it is not suggested that any mechanism, animate or inanimate, can operate irrespective of the sequences of time, the spontaneity of function cannot be interpreted as a special or peculiar kind of quantitation of any sort. Far from being sequential, and so post hoc, the qualification that characterises functional action is so mutually and spontaneously participatory throughout the whole as rather to suggest anticipation. Indeed, as in development and differentiation, the major and characteristic manifes-

[1] cf. Chapter III. [2] Chapter V, p. 56.

tation of functional action is in essence 'futural'. But we must remember that we have not been able to find order represented on the materio-dynamic co-ordinates: we are moving, therefore, in as yet uncharted fields.

To study the per-se relationship of autonomy, not only in the construction and operation of the mechanism of the organic entity but in organism in the field of functional action, we have to be concerned not merely with the quantitative anatomical elements of the construction of the machine, but also with the qualities of sensibility.[1]

Let us take as an example the actional relation of cells to the body of their inhabitation. The cellular constitution of the body mechanism is a picture familiar enough. But, as we have seen, a 'cell' is a unity of sensibilities, specific and unique, held in that unity through the body's supreme faculty – the 'individuality of its unity'.[2] Functionally then, the body is not a mere factory systematised for production, with the cells as automatic units, but a city or civility peopled by 'individualities' called 'cells'. The functional body is an ethonological entity, i.e. a whole bearing the imprint of all its contained specific and unique individualities. It is, rightly speaking, a localisation of *genius*[3] – or idiom – filled with loci of *geniality*, all leaving their own hallmarks on the pattern of action of the whole of which they are the parts. This aspect of function does not, of course, appear when each part is examined seriatim.

Functionally, each and every cell in the ethonomy of the body has its own locus and hence its own individual 'view' *of the whole ethonological field.* As we have already seen, the individual cell's 'view' of that field is fashioned and coloured by the cell-individual's own specificity; and so its individuality[4] appears as one pole of the ethonological field of function of the body. The other pole is the individuality of the ethonological body itself, of which the cell is an inhabitant. The one view – that from the cell pole – is a subjective field of homo-genial specificities. The other view, that from the unity of the body of inhabitation – the ethonological pole – viewing the field of all the contained cells, is that of a subjective field of analogous or

[1] cf. Chapter VI, p. 68 et seq.
[2] Chapter VII.
[3] Genius – *gignere* (*gens*) to beget.
[4] cf. Chapter XXI.

congenial specificities, multicoloured, fashioned and illumined by the conjugal action of all the cells of that body.

Each and every cell is thus involved in bipolar function as between itself and the body of its inhabitation or ethonological body; and that ethonological field of function is the one and *only* field, other than that of the cell itself, that is tinctured with the colour of the individual cell. That is to say, the body of inhabitation as a whole shares in the specificity of each one of the individual cells in question. The *two* pictures – that of the cell's functional action, and that of the body's – are *complemental diverse views of the same subjectivity.*

So in functional action, the '*motivation*' *of any individual cell* hangs upon the 'stereograph', as we have called it, of these two poles of function. It derives by spontaneous mutual synthesis from the total sensibility – of cell *and* of the body of its inhabitation.

This gives us a basis from which to approach the question of autonomic relationship in the organism in functional action. We can now recognise the cell not merely as a materio-dynamic unit, but also as one pole in the field of function of an ethonological unity of sensibilities. From this standpoint we can understand how a cell has no *meaning* in function, except in and through the body of its inhabitation.

The body, or city of inhabitants, has a constitution or diathesis of as many fields of sensibility as there are individual specific inhabitant cells – *and one more,* that of the body itself. Each 'cellular' field of sensibility is itself a unique qualitative entity covering the unity of the body as a whole, while itself remaining a specific unity: wholes upon wholes.[1] And since the body of inhabitation may be said to be 'environmental' to each cell within it, so the functional action of each cell proceeds in mutuality of synthesis with its environment. In this process each cell is a free wheel in per-se relation to the body, its inhabitation.

It is in the individuality of each of the myriad cells in the ethonological constitution of the body as a whole that we can appreciate to the full the principle of autonomous action in the field of function. Owing to its specific uniqueness, or

[1] Chapter v, p. 54 et seq.

individuality, each cell, being itself a 'free' part in relation to the body, has a differential freedom of action.

While then, we have mechanism brought into co-operation with the physical environment through the autonomy bestowed by its free parts, by the same token we have the whole living organism brought into mutual synthesis with the environment through the autonomy arising from its cell 'individualities'.

So it comes about when acting functionally, that, long before it is necessary to take co-ordinate action to meet a change in circumstance, our bodies herald the arrival of the approaching situation from many angles, the synthesis of which will lead to spontaneously co-ordinated action. For example, our kidneys have 'gone in out of the rain' long before we have had time to put up our umbrellas. Our cells are ready for the change long before we will be conscious of a need to make the change. This similarly would appear to be the case in the processes of growth; i.e. development and differentiation.[1] Prescience long precedes prediction. Here again, then, we come nearer to understanding the distinction between any apparent *simultaneity* of mechanism and the *spontaneity* of functional action.

Though not stated in the above terms, the inter-action of body/cells, cells/body, at the functional level of sensibility, has long been accepted in physiology as the field of 'autonomic' action. The term autonomic, however, is given by the physiologist only to those actions characterised as being *beyond* interference by volition.[2] (That, of course, does not refer to, nor include, and cannot be confused with, the automatic, inter-se machine-like operations of which the physiological body is also involuntarily capable.) It is, therefore, important to recognise that the term 'autonomic' as used in physiology has neither the definition nor the implications we have given to autonomy in this text. As used by the physiologist, 'autonomic' action moreover refers merely to the autonomous operation of the body *mechanism*.

Here we are concerned to distinguish between the autonomy of the mechanism and the autonomy of the functionary as user of the mechanism, both essential to the study of the living organism.

[1] Appendix 22. [2] Appendix 21.

The question still remains as to whence comes 'direction' of the directable machine. We have used 'functionary' as a symbol, an unkown x, in the equation of the functional action of organism. Of course it may turn out that x = o, but to find that the organic mechanism and the qualitative ethonological body of the organism as a whole both have the attribute of directability, would seem further to support the proposition that there is some ordering factor yet to be found.

XIII

# Potential for Action

In thinking of mechanism we are apt to take for granted that it will have some form of contained energy to sustain its operation. But contentual energy, i.e. energy coming from within-out such as is found in the internal combustion engine – or the electric or atomic engine for that matter – is not the only energy available. No Australian can forget that it was an engineless chassis, the windjammer, that sailed the ocean to the development of his homeland. The magnificent five-masters, using the 'free wheels' of their sails, amassed their motive power from the winds that blow and the tides that flow. Their motive power came from the 'power of circumstance', that is to say, from without-in: *contextual* energy. The power of circumstance sufficed to take them anywhere; but, alas, not any when. This difficulty was overcome by the invention of the steam engine, which enabled all chassis to go at any *time*. Other automotive engines quickly followed.

The convenience in practical affairs gained by the evolution of an internal source of energy was largely responsible for this rapid development. True, in the use of such engines the power of circumstance always 'happens to be there', but man has in large measure learned to escape from its 'inconvenience' by taking his own environment with him; as in his excursions into Space or into the depths of the sea. So there has arisen a certain general disdain for the power of circumstance. The technologist may even regard it as in re-action to the evolution of contentual energy. But to him it is relatively of little account; he meets it by augmentation of the capacity of the engine. The technologist is, as it were, always 'in the saddle' of the powered entity and never in the saddle of the environment; so that his attention is detracted

from the significance of contextual energy as a factor of primary importance.

If now we move from consideration of the artificial machine to that of the living entity, we are brought up with a sharp turn, for the power of circumstance no longer just 'happens to be there'. In the bionomic world, contextual energy is an indispensable fount of 'energy' to the living organism: a *vital* component in the field of function. The characteristic of functional action is change in organism and environment occurring spontaneously throughout the whole. This change arises in a bipolar field of unity. The energy of this field of unity derives from *two sources*, contentual and contextual. Both are indispensable. In the living world, contextual energy is, then, in no sense an 'inconvenience' to be overcome.

When considering autonomy,[1] we found that it is the relationship of 'free' parts to their whole which brings that whole – whether of mechanism or of the living organism – into operational or actional relationship with the environment. *It is through these free parts of the whole that the contextual power of circumstance becomes utilisable*. They are, as it were, the 'contact points' or leads through which contextual energy may flow – from without-in. It is autonomous action that brings contextual energy into high relief.

In functional action, it is through the sensibility of organism, as we have already seen,[2] that the environment becomes of importance to the living entity. Here the 'energy' involved accrues from qualificatory process: it is actional in the field of quality. Hence, it will not necessarily be manifest in the materio-dynamic dimensions of length, mass, time, which pertain for instance to the contextual energy playing on the unfurled sail of the sailing ship. So the power of circumstance is not to be considered merely with reference to the materio-dynamic *mechanism* of organism; its major significance lies in the functionary's actional field of sensibility.

In subjective mutual synthesis we have seen eclectivity initiating mutual spontaneous action in a bipolar field of unity. It is at the zone of mutuality which this field of unity presents, that contentual and contextual energy meet, there

[1] Chapter XII. [2] Chapter VII.

manifesting the total dynamic of functional action of organism *and* environment. It is, then, in the field of unity – a field of quality – that the association of contentual and contextual energy constitutes the *potential for functional action.*

In an overall sense it might be said that contentual energy is to be associated with – 'flows through' – the automatic elements of the organic mechanism; while contextual energy deriving from the inhabitation affects the autonomic elements. As we have already seen,[1] and it is these two factors together which give to mechanism, to organism, the attribute of directibility.

In the physical field, the only distinction that can be discerned between contentual and contextual energy in their difference in directionality: from within-out, from without-in. But while in the field of quantity the difference is of little moment, in functional action it is this very difference in directionality which in spontaneity leads to the bionomic ordering of the pattern of new specific synthesis. Hence in the bionomic field the mutual mutative action of contentual and contextual 'energy' factors is not only vitalising; it is also *ordering*. It is an essential component of functional action; and the *means* through which creativity arises in the living world.

As bionomists, concerned not merely with analysates of the all but also with synthesis of the whole, we are compelled to conceive of *energy-as-a-whole:* contentual; contextual.

The biologist is constantly faced with just such a situation *in parvo*, when he considers the functional action of any cell of the body in relation to the body of its inhabitation. Indeed, he is accustomed to envisage action as a two-way process of events occurring at the live interstitial membranes or surfaces of contact within the organismal body. Upon these surfaces, from within-out and from without-in, contentual and contextual forces are continuously at play, their mutual action in the living entity issuing in bionomic order.

So the contextual energy potential for functional action in bionomy rises to an importance out of all proportion to its significance in the field of pure mechanism: it cannot be ignored. Hence we see reason to lift contextual energy in its relations to wholes out of its anonymity. Let us call it *emurgy*.

[1] Chapter XII.

Thus, speaking in terms of wholeness, we should have:

*Energy:* contentual, going from within-out; from the parts;
*Emurgy:* contextual, coming from without-in; from the whole.

In introducing a new word for contextual energy, it is not suggested that emurgy is essentially other than energy, but that the two represent different directionality: energy from the parts; emurgy from the whole. Energy and emurgy together would thus represent two parts of *motion-as-a-whole.*

The bionomist has necessarily to be concerned with quality as well as with quantitation. Emurgy only becomes of significance *in the qualification of action.* In the physical world where energy and emurgy are represented by dimensionally identical quantitative entities operating in the system of sequences, any distinction between the two must appear of such minimal significance that it does not engage the attention of the physicist. It is in the bionomic field, where we are concerned with the qualification of action associated with order, that the distinction becomes pertinent.

Recognition of two directionalities of energy we would claim as essential before any attempt can be made to use a functional co-ordinate.

# PART II

XIV

# A New Medium of Reference

This treatise opened with a definition of health. The foregoing chapters have been devoted to an examination of the grounds upon which our definition is based. We now come to the point when it is necessary to grapple with the implications that have arisen.

First, the ambiguous term 'health' can be stated in the more exact phrasing – functional action of organism-and-environment. This has an immediate and direct result. It relieves health from the possibility of mere negative definition as the 'absence of disease'. In emphasising a radical distinction between the processes in health and those that underlie disease, it serves to raise the status of health to a study in its own right, as distinct from the study of pathology.

The examination of functional action has thrown up implications of serious and far-reaching import, making it necessary to embrace a body of phenomena for which there is as yet no terminology; and still less any place in the ideology or technology of physical science. Appreciation of this situation may make clear the difficulty experienced in the initial presentation of this material. It is hoped that it may also in some measure afford an excuse for the demand for patience in any reader confronted with excursions beyond the range of his accustomed consideration.

Since the peculiarities of functional action to which attention has here been called, are not recognisable in quantitative terms, it follows that there is as yet no means of measuring such phenomena – for all known means of measurement refer to quantitation. This constitutes one of the most serious difficulties which now have to be faced.

It must be recalled, however, that in all that has been said concerning the phenomena in question there is emphatically no contradiction of the validity of established materio-dynamic regularities in the operation of the organic mechanism. Our position is that materio-dynamic laws as at present understood, neither cover nor account for certain characteristics of indubitable significance in functional action.

What our examination has revealed is something about which we are admittedly as yet vague, and which is best ascribed to quality. While the entities of quality are not measurable *materialities* they are, as we have seen, *realities* in so far as they exhibit an actional potency in the living organism. They cannot be disregarded in the study of living.

But though in such an investigation it is impossible to ignore the realities of quality, we are still in no position to engage in a study of quality and the process of qualification of things, situations and events until a clearer idea has been gained of where and how to look. At this juncture, we must go back on our tracks and pick up the clues.

The first is that since in functional action every entity, however large, however small, is characterised by specific individualisation, it follows that functioning entities have specific characteristics quite unlike the uniform and unificial entities – the quanta – of Space-Time. So while the equite entities of Space-Time are basically comparable, the entities peculiar to function are basically incomparable.

These antithetic entities of function have, moreover, the characteristics of origination, or creation. This we saw to be the case in examining the ranging of the faculties.[1] The functioning entity, in its growth, is continually moving to new and greater refinements of specific diversification. While each new refinement, as the one before it, is specifically related to the specifically unique entity of its origin, in the process there is no interference with the regularities of materio-dynamic operation. But creative characteristics do not appear on the materio-dynamic co-ordinates. Why? Because neither specific individualisation nor its peculiar relationships are quantitative attributes; hence they find no place on those co-ordinates.

[1] Chapters VI – X.

We have seen how the inherent antitheses between organismal individualities (as in the case of the cells of the body, or in the individual members of a family), are translated into a harmonious functioning unity. But this again does not occur through any materio-dynamic integration and reciprocation. Resolution of the antitheses arises through their motivation in mutual subjective synthesis with the body or whole they inhabit. In this motivation from a total situation, or unity, each antithetic entity becomes the nucleus of action in a bi-polar field of function; that of the entity itself on one hand, and of its inhabitation on the other hand. It is in this field of unity that the stereographs we have called attention to arise. They, too, are purely entities of quality.

The organic mechanism may operate without *present* engagement in any such field of unity. Functional action in which quality appears, is only to be seen in wholes comprised of appositely and specifically related parts. So where any part of a functional whole is isolated for the purpose of experiment or study, all evidence of the qualitative peculiarities of functional action must be absent. Consequently the observer must miss the evidence of quality and its significance in the living process.

In functional action, the curious condition is reached whereby there are as many different specific fields of function of any body, or whole – i.e. as many qualitative 'fields of unity' – as there are specific individualisations inhabitant in that body or whole.[1] So in examining fields of function, we find that the materio-dynamic body may be co-ordinated with a number of such individual and original functional orchestrations. These fields of function may all share in the same system of quantitation; though in quality each is distinct. This symbiosis through mutuality of multitudes of specific fields of function, could be regarded as the acme of synthesis in the whole – a sort of '*embryo of quality*' – which grows and differentiates with a manifest pattern of bionomic order.

The evidence of this mode of motivation in functional action is to be found at the zone of mutuality – mutuality in synthesis of the antithetic entities.[2] But this zone is occupied with changes of a different kind from, say, the sequential

[1] Chapter v, pp. 54-6. [2] Chapter v, p. 52.

directional changes in the materio-dynamic field; there is, for instance, no going from one place to another as in Space-Time. The change as between the cell and the body of its inhabitation is a mutual one arising spontaneously throughout the whole – from one specificity to further specific diversification. It is pre-eminently change in pattern – from unity to unity, again a qualitative event pertaining to bionomic order.

So, synthesis deriving from part and whole in spontaneous mutual action, can no longer be understood as the *effect* of a sequence of quantitative events alone; for it also represents the *affect* of the whole upon the material quantitative translations through which action is manifest. It is, then, not merely a question of events occurring in mathematical sequence resulting in multiplication or any repetitive aggregation of units. The affect of the whole, due to bipolarity in action, arises from the expansion of motivation from the individual locus of the 'multiplied' to the extensive field of the total inhabitation of the 'multiplier'. Thus, for the observer emphasis shifts from exclusive preoccupation with the parts, or the All of parts, to consideration of wholes, and the Whole. But wholes themselves being qualitative entities, have not so far had any pertinence in science.

The scientist has not credited allness with any wholeness. Up to now he has been exclusively concerned with analysis of the particulates of the content; and with the all of the particulates in Space-Time. We might put the position graphically by saying that up to now only the physiognomy of cosmos has been studied, piecemeal as it were, in the post-mortem room, so yielding information as to the morbid anatomy and morbid physiology of the living cosmos. Thus, while the quantities involved may be known, the qualities of the living world have escaped notice; or have been ignored.

Perhaps the latter-day attempt to reduce the qualitative patterns of unique entities to statistical terms of reference is no more than an indirect recognition of the uniqueness of their specific diversity; an attempt to use a known, but inappropriate, technique to bring phenomena not yet understood within the narrow limits of the known.

Looked at from another aspect, it might seem that any

essential involvement of a part, or individuality, with its whole would necessarily demote the part, so robbing it of its regality. This is a question which requires close scrutiny, and to which we shall refer again. The student of functional action must hold fast to the fact that the outstanding feature of every biological entity is its abiding individuality. But we have seen already[1] that this very feature – individuality – *is only lost* when and wherever wholeness is abrogated.

It is just this seeming restraint of whole on part that growth puts upon mere multiplication and that differentiation puts upon mere repetition, which in functional action constitutes a 'field of opportunity'. Only through the spaciousness of this field of opportunity does the richness of the diversity of the whole become available to each individual entity, so sustaining that entity as an individuality in the process of living.

In functional action, or health, the maintenance of individuality is of primary import. We found that the directivity of the organismal whole in its context depends upon the autonomy of the parts, or individualities, within that whole. But while autonomy necessitates a freedom of the parts within their whole, a sharp distinction has to be made between the freedom of a part attached to and acting with its whole, and that of an unattached or 'loose' part. Whereas autonomous, i.e. free parts attached to their whole, share progressively in the spaciousness of that whole, any 'loose' part – by its isolation from the whole – is restricted merely to chance *re*-action. For the individual in that case, the possibilities of progressive specific diversification that inhere in the property of the whole, retract and shrivel and 'quality' is lost. Likewise, loss follows if the part, losing its freedom or autonomy, becomes a 'fixed' part within its whole, in which case action is inevitably stayed, or reduced to mere automatic operation.

The freedom of both part and whole does not imply nor invoke chaotic action, as would be the case were each specific individuality but a 'loose wheel'. It is the autonomous ordering of part and whole which precludes chaos – *but in some qualitative medium in which patterned order inheres*. This escapes recognition in the Space-Time dimension.

[1] Chapter VII, p. 81.

Many distinctions have emerged between the scope of investigation necessary to the bionomist and that necessary to the physical scientist. This is no less true even if the physical scientist is not concerned purely with inorganic material but, as *bio*-physicist or *bio*-chemist or even *bio*-logist, is investigating material withdrawn from the living entity; or the living entity *withdrawn from its context.*

It is only in the approach to content-context as an essential whole, or unity of function, that the bionomist can begin to understand the nature of health. Step by step we have moved into a realm of phenomena not recognised as relevant in physical science. We have also moved beyond any mathematical system pertinent to physics.

Not being of Space nor of Time, the category of phenomena to be observed in the functional action of organism demands a new approach to the living world: not instead of, but alongside and in addition to that which has engaged the physical scientist up to now. For this reason we have postulated the need for a third, or functional co-ordinate whereon the manifestations of quality may appear.

This functional co-ordinate for recording data concerning the patterns of quality will, of course, eventually have to be reconciled with the materio-dynamic co-ordinates referable to quantitation.

But the prospect now begins to loom before us of quality becoming as 'measurable' as is quantity. By 'measurable', however, it is not implied that quality will be capable of being recorded in terms of quantitation. Planck has finally disposed of the possibility that one quantity can 'qualify' another quantity. But once quality can be discerned as an entity in its own right, it would then become possible to envisage it being recordable in terms of some unit – or rather unity – pertinent to a medium of quality; in the same way that the materio-dynamic co-ordinates have their appropriate medium, that of Space-Time.

Quality has its own identity. It would appear to be a *reservation of the bionomic world of specificity, uniqueness and origination,* belonging to and appearing in some medium as yet not defined.

XV

# Memory

There has now to be identified some all-pervasive and yet so far unexplored medium; some 'aether', vehicle of quality in which we live and in which organism functions in subjectivation in the specific patterning of cosmic order. Let us call that medium *Memory*.

The adoption of so common a word as 'memory' for a cosmic medium in which we live, as we exist in Space and Time, may well appear peremptory.[1] It is customary to think of memory as a personal attribute; something *we* possess – for we can lose it! Memory is used, too, in other contexts, many of them loosely technical: e.g. ancestral memory; group-memory (as of birds, lemmings, etc.); used as the content of the subconscious from which the psychologist has insisted that memories may arise – often to our undoing; or, more recently, as the word is appearing in the language of the modern science of communications.

Thus, as commonly used, memory is an omnibus word more or less ambiguous and loosely defined. But the fact must not be overlooked that so were 'space' and 'time' before science, by clear definition, elevated each in turn to cosmic significance. In the context subsequently given them by science, the personal and local meanings of these words have remained undisturbed, so leaving no confusion of thought between the Space-Time of the physical scientist and the space and time in which we go about our lawful occasions. Neither, then, should adoption of the common word 'memory' for a cosmic medium, nor for the conceptual basis of a dimension of use in science, dismay or lead to confusion.

[1] Appendix 23.

We are setting out to investigate a new *medium*. All we know to begin with is that it is one with which we have some personal contact; so, we will begin with ourselves. Memory is no longer 'ours'; we have but a locus in Memory, as we have but a locus in Space. As we are aware of our locus in Space through our faculties, so we are aware of our locus in Memory through our re-membering (and forgetting) things, situations and events – though we do not as yet recognise the medium in which our recognition of them arises.

Walking along a road, alive to the sights and sounds around us in the specious present, so we may walk along the same road at the same time, yet with the things, situations and events of quite another day 'picked out' of Memory – remembered. As we go along, our movements in Space are 'here' and 'now'; tangible, measurable, factual events. But our remembrances also are 'here' and 'now', though the material Space-Time substance of the events to which they are referable is neither presently tangible to us, nor objectively measurable in the now. Nonetheless, the remembrances of what is not here and not now cannot be denied. Moreover, it is common knowledge that remembrances may powerfully influence present action. We do not need the sight of our wife, our child, or of ourselves in the looking glass to stir us to action.

So, though our remembrances may not be accounted for through the immediacy of sensation reaching us through the sense-receptor mechanism, though they may defy quantitative measurement, owing to their potency they cannot be ignored in the study of living.[1]

In what does this potency of remembrance lie? When the quantitative entity, light, falls on the retina we, through our faculty for 'vision', perceive it as colour; a qualitative entity. What is it we re-member? it is the colour; not the light waves. Earlier we saw that in the process of facultisation, our income of objective quantal concatenations registrable in the physicist's dimension Space-Time, is translated by the living recipient into meaningful things, situations and events. This is a translation from quantities into qualities; a translation into the medium Memory.

[1] Appendix 24.

In Memory the things, situations and events appear as subjective phenomena, for in the translation they have become specifically related to us, thereby acquiring meaning for ourselves. But as such, being no longer recordable on the materio-dynamic co-ordinates, they elude measurement in Space-Time.

It is well recognised that all our faculties exhibit a capacity for re-collection. It is usual to attribute this re-collectability in Memory to our *own* memory and so to treat it as a perquisite of the entity – or even of its biological constituents. But our own capacity for recollecting must not be confused with the source from which recollection derives. Our eyes are not the source of light: they are merely our instruments for knowing of light waves accountable in the dimension Space-Time. In the same way, our capacity for recollection is our means of registering patterns of specificity in a medium, Memory. What we are in the habit of attributing to ourselves and to other organisms as personal memory actually derives from our locus in some medium other than Space-Time, from which our remembrances derive.

In the process of living we all use Memory: we cull from it 'thoughts', just as we pick out things in Space. Indeed, all things in Space are coloured for us by thoughts gathered in the medium Memory. These thoughts in Memory are as *actual* as the things we touch in Space are *factual*. To be alive it is as essential presently to use the medium Memory, as it is to use the medium Space.

Perhaps it is easier to appreciate the depth of our involvement in Memory where the absence of capacity for thought which arises in this medium is conspicuous. A mentally deficient child may have developed sufficient capability for thought – i.e. sufficient excursion in the medium Memory – to recognise any semi-solid grumous mass as something upon which it can exercise its as yet dim faculty for manipulation. Pudding, mud, sand, faeces, may all have acquired this much quality in the child's apprehension. But thought fails it in further discrimination. So it will put any or all into its mouth indiscriminately; either in hunger, in an acquired habit of greed, or simply the better to appreciate the texture of the mass. With its limited range of excursion in Memory, it is as yet unaware of any

difference in the quality; i.e. the specific (memorial) identity of the respective substances.[1]

But the issue is deeper than that. We can, in fact, only know 'where' we *are* by having 'memorised' 'when' and 'where' we *were*. This we have already seen in the simple example of children born blind and later gaining sight.[2] Even though equipped with sight, to be without vision – recognition of patterns in Memory – is to be bionomically 'blind': blind indeed, not knowing how to act, nor how to utilise our factual sight.

This then is the issue. Immobilised in the medium Memory, we are lost. We could not even locate ourselves in Space were we not living in the medium Memory.

To appreciate this let us return to the walk we took in the opening of this chapter. It was not then only in the case of remembrances of some other day that we were involved in Memory. We could not have recognised the plants or birds of the hedgerow, could not have known what lane we were in, could have interpreted no signpost and still less have reached home by the end of our journey without the active present use of Memory – in every step we took. Blithely unaware of our use of and reliance on the medium Memory, we believed we were only using it in our remembrances of the 'past'! In fact, to lose our reference in the medium Memory is to be disorientated; without sanity, without health. We are immersed in Memory. We *are* in two worlds: in the world of Space and in the world of Memory.

It is important to grasp this as relevant to all action. However 'objective' the observation of things, situations and events, their recognition by the observer and all his technical means of assessing them, would be impossible without the use of this medium. So in all his observation, the scientist too is using the medium Memory; whether he remembers it or not; and whether he likes it or not.

In functional action it is *thought* – the recognition of the appositeness of specific patterns in Memory – which progressively relates quantity to quality. The essential difference between the materialities of Space and the realities of Memory lies in this difference between quantity and quality. The

[1] Appendix 25. [2] Chapter VI, p. 71.

quantitation of mass and motion in Space; the qualification of specific patterns in Memory. Though it is obvious that the two must be co-ordinable, they are not identical. Not being the same, they must not be confused in science. Both must be recognised; both accounted for.

As we exist in Space, so we live in Memory, able to 'move about in' and 'play' with 'masses' and 'molecules' of Memory, making all sorts of memorial 'objects'. Some of these, as we shall see, are living and creative; others are re-duplicative; still others are fictitious. Indeed much of our daily lives is spent in perpetuating the most outrageous fictions woven from century-old recollections in Memory; memorial 'slums' which we fasten on to the present, so distorting and deadening the process of living.

There is a great open Memory as there is a great open Space. Every bit of Memory 'moulded', 'modelled' in quality, has its specific pattern – its earth, atmosphere, sky, planets, trees, plants, animals, men; just as every bit of Space has its 'shape': 'weight', accountable in quantities.

Since then, we are *in* Memory just as we are *in* Space, we can envisage all Memory as open to our use, just as we envisage all Space as open to our use. But our penetration of either medium is in fact very local and personal: not until appropriate means have been found to extend our excursion are we freed to move within the vastness of either. The finding of these means hangs on our understanding of the laws that govern the respective media.

## The Unwitting Use of Memory

We made an initial approach to the medium Memory through remembrances we can pick out from what we call our 'past'; those *we* can re-member. We might call these memoranda. But we are much more than a sheaf of memoranda! There is much more available to us in Memory than the few items we recognise 'at rest' within ourselves. There are, for instance, all those remembrances we even remember as our own – though we have forgotten them. There are also those we have forgotten – but unwittingly remember. To take a simple example, how

often have we escaped bodily harm through 'remembering' in a flash what we did not know we 'knew'.

But there is a vastly greater body of all the things, situations and events that have come to be specifically related to us but which we no longer remember – even though they are physically embodied in us and in our present action. Such 'remembrances' – recollections in Memory – are commonly said to lie in the 'sub-conscious'. That begs many questions: in particular that we know what 'consciousness' is.[1] The word 'sub-recollective' might be used for those recollections not immediately available to us. But that will not do either, for those of our activities which the physiologist calls 'autonomic' are very busy continuously re-collecting much that escapes our focused thinking. It is their memorial content that keeps our hearts beating, our lungs breathing, our kidneys functioning.

Once, however, we accept the reality of Memory as a cosmic medium in which we 'live', as we readily accept Space as the medium in which we exist, there is no longer any need to find a term to designate all the boundless content of Memory open to recollection (though we cannot remember it), any more than there has been need for a distinctive term for the vastness of Space, with which we are not in immediate contact. All Memory and all Space are open to our use – at least memorially – even though we know relatively little how to use them, and so use but an infinitesimal fraction of either.

So far we have been considering the subjective use of the medium Memory, but Memory is by no means manifest only in those remembrances (and forgettances) appreciation of which lies in the subjective. There are evidences of the impact of Memory to be found in what we – forgetting that we can only recognise them by the use of Memory – are wont to refer to as the 'objective' materialities of the Space-Time medium. Here the imprint of the content of Memory appears in action-pattern. It is recognisable in the tissues of organism; the finger-prints; in patterns and postures found wherever functional action has traversed Space-Time.[2]

Such postures are conspicuous, for example, in the ontogenic progress of the embryo in the course of its growth, Every embryo

[1] Appendix 26. [2] Chapter IV.

is *in* Memory, as it is in Space. Conceived in Space, it there enters into materialisation in the memorial pattern of its ecological origin; carrying with it the specific memorial patterns of its origin, both genetic and nurtural. Already we have seen these to be of two different qualities: the one of homologous, the other of analogous or congenial specificity.[1] Here, then, are two distinctive memorial categories which the embryo bears along with it and uses throughout its growth. As its own individuality grows, so it gathers further and new memorial patterns specific to itself, which it collects in Memory as it goes into the future.

Inheritance is clearly associated with a particular locus in Memory. Experimental evidence makes it clear that while quantitative inheritance proceeds sequentially, the qualitative memorial factors permeate the whole body of the embryo. It appears, moreover, that there is a regular ordering of this permeation, as though the embryo were conceived within a memorial pattern into which the materio-dynamic bricks – the cells – have to take their places. Such a 'pre-determination' of pattern is illustrated, for instance, in the growth of the liver. It begins by the differentiation of one cell. That cell itself is not pre-determined. It occupies a pre-determined position: that is to say, it grows within the action-pattern of the individuality of which it is a part. Up to a certain stage in differentiation it is possible to transpose and otherwise juggle with cells experimentally, so that almost any cell can become a liver cell, provided it is placed in a particular position in relation to the action-pattern of the memorial whole. A cell so transposed will then multiply to the point of fitting the pattern of liver. The fact that in the earliest phase it does not seem to matter which cell is chosen, demonstrates that it is not the cell that is 'predestined'. Apparently it is the locus within an action pattern, i.e. its locus in a Memorial whole, which determines *how* any one of the cells will grow and *what* it will become in its materialisation. But that is a qualitative, not a quantitative factor. Like the finger-prints, *all action-patterns are records of patterns of specificity deriving from the medium Memory,* and finding expression in materialisation in Space.

As with the cell, so with the embryo. Its action-pattern is of

[1] Chapter x, p. 38.

a memorial whole determined by the process of mutual subjective synthesis with its inhabitation, the maternal body; i.e. by the actional unity, or whole, of which it is a part.

It begins to appear that all wholes are entities in the medium Memory: entities of quality. That perhaps is why, though the importance of wholes and wholeness has been admitted,[1] they have hitherto been ignored in science. Finding no place on the materio-dynamic co-ordinates, to what could they be referred? But now that we can envisage a medium of quality to which they can be assigned, it is possible to refer with some definition both to wholes and to the quality of wholeness. So we can also approach with more confidence the study of action-pattern as useful post hoc records of the orchestration of wholes in Memory.

It is in the orientation, or ordering in the body, of the materio-dynamic processes in the pattern of unity, that the important distinction between 'growth' and mere 'multiplication' can be appreciated. We cannot get away from the difference between these: it is one of the biologist's bugbears. Recognition of a medium Memory may possibly prove significant in elucidation of the distinction between the two processes.

Modern studies of embryology and of the protein constitution of the cell and its nucleus already demonstrate that *what* is done may come to be known in the fullness of substance and sequence in the Space-Time medium. But there still remains the mystery of *how* it has come to be done in that particular order: *how* it comes about that in functional action each living entity maintains its own specific and unique configuration. For example, sieve out and separate all the cells of a fertilised ovum in its early stage of growth; put the cells haphazardly together and the ovum will reassemble itself in its memorial wholeness, and continue to grow – in a measure.

It is not denied that this ordering which we are ascribing to qualification in Memory, cannot be bypassed. In the allied fields of experimental embryology and tissue culture, an experimenter can bring about an association of the parts of any organic entity quite different from that found in their ecological situation in nature: e.g. monstrosities, abnormal forms, rever-

[1] cf. *Holism and Evolution.* J. C. Smuts, Macmillan & Co. Ltd., London (1926).

sions to more primitive states, neoplastic forms, etc. In terms of this thesis this would imply that the experimenter has conditioned his experiment by using his own selections from the content of Memory to supplant the indigenous memorial content of his material. But in so doing, is he not demonstrating – by default – the existence of an orientational affect from the memorial locus proper to that individuality?

What is challenged here is not the established facts, but their current interpretation – itself a memorial factor. Our claim is that terms of reference wider than those hitherto available are necessary before the interpretation of already known facts can fit the body of phenomena that attach to the process of living.

Still more profound and more all-pervasive are the imprints of specific patterns in Memory recognisable in the certainty with which the organism is placed in its phylogenetic order. These distinct and 'materialised' postures of the teeming species of the organic universe, clearly reveal deeply incised action-patterns – the manifest of conspicuous patterns in the medium Memory. Indeed, it might justly be said that the theory of evolution of Darwin and Wallace is *the* major study of the medium Memory so far undertaken; though not, of course, couched in the terms we are proposing here. Theirs was the first clear and bold attempt to analyse and to account for the specifically patterned order of the organic world.

It may well be that the process of evolution can only be properly understood as the expression of order in one organic whole: i.e. in cosmos as *organismal*.[1] Seeing the whole as organismal, as it appears through our bioscope, the species of the living world rise into prominence as the organs or parts of the body of a greater 'organism'.

These action-patterns that phylogeny presents, as all other action-patterns, are the evidence of quality. Now that we are in a position to see that quality has its own identity, we can recognise it as a *reservation of the bionomic world of specificity, uniqueness and origination* belonging to and appearing in a cosmic medium Memory.

[1] Chapter II.

## The Content of the Medium Memory

How shall we conceive of the content of this medium Memory? It is that of the configurations of all the specific diversities and their specific wholes – the realities of quality. These realities are the archetypes of all that we call 'materialities': 'translations' of all that we see and touch, smell and hear; and also of all we feel and suffer and enjoy – all that can be recollected and all that can be conceived.

So just as on a cosmic scale we can conceive of the assembly of all the entities in Space (whether we personally have contact with them or not), likewise there should be no difficulty in conceiving of the assemby on a cosmic scale of all the entities in Memory; both those that are remembered and all those myriads that are forgotten.

But there are crucial differences between the attributes of the content of Memory and those of Space. In the sequence of events in Space (always remembering that we can only recognise these in Memory) the identity of each successive construct, whether of masses or molecules, is obliterated by the displacement of its constituent parts as new construct after new construct arises. In the medium Memory there is no such dissolution of pattern; no loss of identity through successive change in its content.

When *we* forget – or lose our memory – it is not that any memorial event is lost or wiped out. It is merely that the capability of our own faculty to recollect it is lost. Though *we* may forget, Memory goes on 'memorising' – in spite of us. Cosmic memory cannot 'lose' anything. Its virtue lies in the *ineffaceability* of its specific patterns.

We have already seen in the process of mutual synthesis, the formation of new specific wholes in Memory; seen that when a new specific whole is created, the specific quality of the parts that form that whole is not obliterated. The child – a new and unique pattern in Memory – bears with it the specific patterns of its parents; their patterns of specificity being taken up into and remaining in 'eternality' in its ineffaceable content.

So comes into action the 'potency' of history, recollectable

and unrecollectable: not as a concoction or selection of past events, but as a record of the 'acme' or 'essence' of a continuing mutual subjective synthesis – 'origin' of the next synthesis.

Memory, ineffaceable, yet pregnant with new patterns of specific diversities, new wholes, 'precedes' us into the future. As blueprints of a building that may materialise, so the next patterns of specification that may forthcome, are in Memory. They are there to be re-collected and collected as occasion arises for synthesis; just as entities in Space are there to be accented and singled out for appropriate use as required. Here again, is yet another crucial difference between the materialities of the content of Space and the realities of Memory. There is no attribute of 'futurity' in the medium Space.[1]

## The Utilisation of Memory

On what does the organism's capability of utilising Memory depend? It does not stem from any particular organ, such as the brain. The developed brain may receive and house the impress of memorial patterns of specificity; and may re-iterate continuously materio-dynamic sequences conforming to those memorial patterns. But while housing these 'records', it is not their initial source. Before any material brain has appeared the embryo is re-collecting its own antecedent specificities in Memory. Nor does the utilisation of Memory depend on any of the commonly accepted faculties, such as mind, or intellect. For again, if we admit that we are conceived and born in Memory, its utilisation is proceeding long before these too can have developed in the embryo. It is one of the baffling characteristics of organism, one which in the main distinguishes organism from the inorganic entity, that it *re*-collects its own indigeneity; both embryologically and phylogenetically.

We then shall presume that the functioning individuality utilises Memory as it utilises Space *in its whole existence:* and whether its organs of discriminative action are differentiated or not. This applies to the action of all organism: whether many-featured – as in the higher species – or like amoeba with but the one feature common to all – the individuality of its unity.[2] With

[1] Appendix 27. [2] Chapter VII.

this prime feature we have already associated the overall faculty of the organism, through the exercise of which its general sensibility maintains the individuality of its unity. The utilisation of Memory by the organism must therefore be attributed to exercise of its prime faculty for the maintenance of its individuality.

'What' any organism can do depends upon the particulars of the materio-dynamic possibilities in its Space-Time locus. 'How' it uses these possibilities, how they will be orientated and in what order those Space-Time possibilities will be employed, is to be sought in its use of the medium Memory. The 'what' lies in quantitation and is of the several parts: the 'how' in the qualitative patterns of Memory belonging to that entity as an ethonological whole.

The ineffaceability of the memorial content has its simple practical and personal implications. For example, it has always been a mystery that we 'know' when we are unable to remember. But if we are *in* Memory, as we exist in Space, we could well be aware, intuitively at least, that our whole is recollectable in Memory. When a limb is anaethetised, even when it is materially lost, amputated, we still 'know' we have it, both involuntarily or 'autonomically' as the physiologist puts it, as well as through our facultised sensibilities. Or, when we have lost an eye, we are still left with the 'memorial' eye. A 'ghost' perhaps, but with this 'ghost' and the remaining eye we can still achieve stereographic memorial vision upon which to base action. This is an impossibility for an individual who has always had but one eye – though he may learn to compensate for the defect by use of his other faculties. We know that a child's leg shortened by fracture can completely recover, as long as the limb is not prevented from growth by instrumentation. If the child is allowed *to use his whole body* he will re-collect his wholeness – and the shortened leg will assume his own (memorial) pattern of bodily symmetry and so grow to the stature of the uninjured one.

In ineffaceable Memory we each have our own locus. We cannot 'lose' that locus, any more than we can lose our locus in Space. Nevertheless we may not be aware of it. Nor do we always *presently* use it; for at any moment we may escape from

further qualification in the medium Memory. Then, foregoing the mutuality of synthesis arising eclectively in our locus in Memory, ceasing to create further and new patterns, we fall back on the *automatic use of memorial patterns* we have 'inherited' or gathered earlier in the process of living. This we may do either momentarily; for any length of time; or for the rest of our lives.

Experimental evidence drawn from the field of involuntary or 'autonomic' action of the physiologist, would seem to imply that once facultisation, i.e. specific discriminative action, has been experienced by any organ or part of an organic mechanism, that part can continue either in light association with, or in deep penetration of, its locus in Memory. With the proviso that it has once become facultised, subsequently the mechanism is capable of automatic operation – even when isolated from its whole. The materio-dynamic constituents, before they become isolated from their whole, having apparently taken an indelible orientative imprint from Memory, can continue to operate on the memorial capital they have acquired without further qualification in that medium. So while continuing to exist in space, the present autonomous use of Memory can be foregone. The items of the memorial content then come to be used purely automatically.

Pathological process also shows that while the organism does not lose its antecedent imprints in Memory, it can forego the impact of any *present* patterning in Memory. One of the characteristics of disease is that it throws the individual step by step into the position of relying more and more on the automatic use of the materio-dynamic resources of his bodily mechanism. This process is, then, rightly regarded as *re*-action; the re-enacting either of more primitive, or of childhood memorial patterns. So, escaping a 'live' engagement in the medium Memory, in the pathological processes that accompany disease the entity can become a 'scar' in the body of Memory; as inert tissue becomes a scar in the material body. But scar-tissue, though inactive, does not thereby escape embodiment either in Space-Time or in Memory.

That which orientates the organism's utilisation of the material properties available to it, has primarily to do with the quality of patterns of specificity it re-collects and collects in

Memory. Take an everyday example: you meet Smith, and unless you can 'place' him in Memory he will remain a mere man – not even a name. Before you can re-collect him, you have to 'choose' him – by yourself recognising in him some specific pattern that is unique and individual. For this 'choice, to be made, there has to be some mutual factor in the realm of quality – some appositeness in the patterns of Memory – between you and him. Without that, he must remain no more than a 'chance' or a number in a serialised sequence. *Act*ually, i.e. functionally, we can re-collect Smith in Memory by the music of his voice by which we can pick him out of a million. Even before he reaches the door, we can tell from his tread not only who he is but if the errand from which he is returning has been successful; and whether he is ill or well that day. In the same way, we know a touch by its 'feel': we call it the 'quality' of touch. Once laid down, these action-patterns are re-collected in Memory not by their Space-Time relativities, but by the absoluteness of their specificity – their quality. Voluntarily or involuntarily, they are re-collected by *thought* – the association of apposite specific patterns in Memory.

For the observer, these realities constituting the content of that medium are the indispensable translations of what he believes to be persons, things, situations and events – of all that is related to him in the material world. Untranslated into realities in Memory, for him these can have no *meaning*.

Eddington confronted us with two tables: the actual table we sit at and the factual table of the Space-Time dimension. But now we find that there are three tables: the mass-form table; the dynamic-cohesive table; and the functional memorial table born of thought. Moreover, it appears that this last was the first, or mother of all tables! The memorial 'table', initiating and acquiring meaning by association of apposite entities in Memory, was placed among the ineffaceable and eternal patterns in Memory – before any table could have existed in Space or Time; and before it could have significance in the dimension, Space-Time. From the initial 'event' in the medium Memory, all other tables arise –re-collected in Memory.

It is in Memory that things, situations and events ripen into specificity and acquire their qualitative reality. There,

remembered or forgotten, they await 'plucking' through thought by living entities born into Memory who, presumably 'knowing' their thoughtful way about in that medium, re-collect 'table'.

So it may be said that while
we exist in the *present* – in Space,
we live in the *presence* – in Memory.

XVI

# Will

Examination of certain phenomena peculiar to the actual world has led to the consideration of Memory as a medium of cosmic dimension. But that after all is no more than a theoretical proposition. It does not enable us as observers to come to grips with Memory; does not tell us of the relationships within that medium by which to chart its patterned content. How, then, shall we proceed?

The physicist's knowledge of the factual world has been gained from study of the relationships of mass and motion in the Space-Time dimension. In exploration of Memory, can we arrive at further understanding by parallel means?

Memory is not static: that we have seen. It is accretive: there are shifts and changes in its content. But these have already appeared to be unappreciable and unapproachable in the terms of any laws or regularities of energy in the physical world. If not in Time, where then do they arise? Presumably there must be some 'time-like' medium associated with Memory in which a dynamic involving change in that medium is appreciable.

The difficulty of language again faces us here. Already words have had to be found for various phenomena that have come to light in our investigation of the process of living. At this juncture, some words or symbols applicable to events arising in Memory must be at hand. What shall we call a medium to which all movement in the content of Memory could be referred – in the same way that motion is referable to Time?

Very tentatively, and fully alive to the possibility of serious misunderstanding, whatever movement may be found in the

content of Memory we here propose to attribute to a medium, Will.[1]

Memory, we have seen to be of cosmic scope. Hence any medium in which movement arises in the memorial content must also be approached in the same terms. Thus in this text, 'Will' refers to a cosmic medium associated with cosmic Memory. Using this convention then: as events in Space occur in Time, so events arising in the medium Memory are to be conceived as occurring in *Will.*

There are further difficulties of terminology. How shall we speak of any 'movement' that may appear in the content of Memory? It would be only prudent to discard the ill-defined word 'movement'; and still more to avoid the technical term 'motion' so deeply associated with Space-Time. In exploring a new medium, some distinctive term is called for. Hence, in referring in general to all movement involving change in the memorial content, we propose to use the word *motility.*

Equipped now with a bare minimum of symbols for what we may find, we can set out to enquire further into the process of qualification in the memorial content; speaking of any change in that content as a manifest of motility; and referring any such motility to Will. Thus we should have: motion in Space-Time; motility in Memory-Will.

Appropriation of the word 'motility' for movement discernable in the content of Memory, would considerably extend its use in biology. Contemporarily the word is reserved for the appearance of actional movement of certain biological species, but without reference to the physical energy transactions involved in that movement. In this text, we ourselves have referred to the motility of a bacterium as an instance of action-pattern distinguishing one particular type from other varieties of bacteria – a qualitative distinction. The general use of the word 'motility' for shifts and changes in the content of Memory, while extending the more local use of the term already established in biology, thus in no way contradicts its accepted usage.

The fact that motility in Memory is not essentially referable to Time and cannot be conceived of in terms of the effect of

[1] Appendix 28.

motion on mass, nor be associated with any form of quantitation as in Space-Time, constitutes a major difficulty. So in its exploration, use of the terms current in physical science would not merely be inadequate but misleading. While, for instance, we may speak of motion as associated with 'displacement' in Space, to employ such a term with reference to motility in the content of Memory would be to deny the essence of events in that medium. So in setting out to explore the process of qualification of the memorial content, the body of accredited factual knowledge deriving from use of the dimension Space-Time must for the time being be set aside. Exploring the 'dynamics' of qualification is like playing a new game: the 'pieces' are different; and the moves in the game will surely be different too. The essential features of procedure must be grasped before any attempt can be made to put them to practical use.

We are moving in uncharted territory. Overlooking the field of Memory, the first thing that attracts attention is the lively creation of new wholes in its content. This is something we are already familiar with: a phenomenon we came across early in this text as a characteristic of mutual subjective synthesis in the living organism.[1]

In that process, we recognised the inherence of a pull or attraction between the apposite specific complements entering into synthetic relation. To distinguish this allure from any form of energy known to the physicist, we called it eclectivity. But to what realm could such a factor be attributable?

Having now found a cosmic medium, Memory, housing the specific configurations of quality, eclectivity finds its place as that which brings about further qualification of the content of Memory. *It is eclectivity which induces motility engendering the realisations of new wholes in Memory.*

In the content of Memory it would appear that each specific whole, however extensive or however restricted its locus, carries its own 'charge' of eclectivity. This charge is potentially competent to induce motility in the presence of apposite entities in the memorial content. Any two such complements coming together eclectively constitute the poles of a bipolar

[1] Chapter v. p 57 et seq.

field of unity, in which field the eclectic charge of each is released. A new whole results; that whole carrying its own charge of eclectivity. So in turn each new whole bears a dynamic potentiality for yet new 'futural' fields of unity; and hence for further synthesis in Memory.

Motility in Memory is, then, to be associated with fields of unity. So, making use of our proposed terms of reference, fields of unity appear as the prominent factors in the study of Will.

Exaltation of the stature of specific diversity exalts the intensity of eclectivity. Hence apparently there are different intensities of eclectivity. Such differences in the degree of eclectivity we have seen to be evident in action-pattern. In certain circumstances, still more are they appreciable, subjectively, by the participants in eclectic motility. So it follows that the manifestation of eclectivity is to be seen most clearly where there is the highest degree of specificity: i.e. in the most highly differentiated species. Once again, then, man becomes the species of first choice for the initial investigation of this new territory; and in man subjective evidence is at least in some measure communicable.

It is, of course, to be expected that the pre-eminent manifestation of eclectivity should be subjective, for motility in Memory is the prominent characteristic of the process of mutual *subjective* synthesis. Since the subjective has proved largely intractable in science, the fact that the primary evidence of motility should lie in the subjective does constitute a serious issue for the observer. Nevertheless, it must not be forgotten that both subjective and objective evidence of mutual subjective synthesis are to be found in functional action; that we saw earlier in our first discussion of action-pattern.[1]

Let us begin by looking at man's action in Memory. First we find subjective evidence both of the charge of eclectivity and of its release in the field of unity induced. We have already seen the presence of an eclectic charge to be appreciable in the avidity of one apposite towards its mate, so giving rise in each complement to the feeling of 'being drawn' each to the other.[2] This subjective feeling might be called the *appetite for unity*. Then

[1] Chapter IV. [2] Chapter X, pp. 128-9.

again, the evidence of the 'arrest' of eclectic motility co-inciding with the acceptance of an eclectic charge in a field of unity, is accompanied by another subjective manifestation – *the feeling of ease.*

## Appetite for Unity

Eclectivity, flowing with the exquisite appositeness of high facultisation, is accompanied by some of the deepest emotions of which man is aware; and by some that are actionally the most potent. For instance, in the memorial process we attribute to 'thought',[1] a sudden 'flash of meaning' (i.e. appreciation by the subject of a novel appositeness of specific diverse patterns in Memory) may induce elation; or even deep emotion. A man so stirred by having 'seen' something of which he was not previously aware, may say that he has been 'inspired', and this assertion may be confirmed by his action-pattern. He may appear a changed man. But the change can be one of much more than mere aspect; it may issue in change in word, in deed and in conduct. Not only is there subjective evidence here, there is also objective recordable evidence of an 'event' in Memory and Will.

Still more obvious is the feeling, appetite for unity, in the approach to mating of the sexes. Here evidence of the pull of eclectivity may be so sudden, striking and strong as to issue in the feeling 'falling in love', to which special and peculiar 'quality' is commonly attributed.

In this pre-eminently subjective upheaval, eclectivity may again be both subjectively and objectively appreciable: felt, in the emotions of the individuals concerned; apparent, in the action-pattern they display. Indeed, from their action-patterns an observer may know that a couple have fallen in love long before the fact is announced; even before either has admitted the fact to him or herself.

While evidence of initial eclectic motility between the pair in courtship may be pronounced and readily appreciable, eclectivity in their field of unity can also be discerned in many aspects of functional action, its long-drawn-out manifestations

[1] Chapter xv, p. 170.

cast in many wavelengths and many and varying degrees of intensity. It may, for instance, continue affective throughout the lives of any pair who, though continuing to act in unity, nonetheless do not continuously wear their hearts on their sleeves.

Then again, the power of eclectivity may be unaffected by the most extreme physical separation of the parts, or poles, of the field of unity bearing an eclectic charge. That one of the pair is in the Antipodes and the other in Iceland may not in any way disrupt the field of unity, nor diminish its eclectic potential: it may even enhance its power. So also, separation even of death may fail to disrupt the memorial unity, or negate its eclectic potential. The memorial ghost sustains the bipolarity of the field of unity. This phenomenon we have seen in relation to facultisation in organism; as, for instance, in the loss of a limb.

So it becomes apparent that physical materialisations which are destroyed when the parts are riven apart, are the very antithesis of realisations in Memory deriving from motility in a field of unity in Will. Motility in ethonological wholes differs fundamentally from the behaviour of mass and motion as in Space-Time. The law of the inverse square of the distance is without significance in the 'dynamics' of qualification in Will.

Eclectivity is not the only manifest of motility in Memory. Where the intensity of eclectivity is high and the appetite for unity is marked, other and subsidiary manifestations of motility may arise. For instance, on occasion there can be seen what could perhaps be described as an 'induced current', manifest in the stirring of the emotions and behaviour – though in a lesser amplitude – of other qualitative unities with a similar actional potential within range of an active field of unity in Will. This phenomenon is by no means infrequent, or unknown though not attributed to Will. It may be seen in the behaviour of any (bionomically) integrated society: human, avian, etc. Possibly it may be the motivating factor involved in situations such as group-action, herd-action. For the moment we will call this qualificatory dynamic field a *field of altruity*.

A first cursory look has disclosed two varieties of motility in Memory. Probably many others await disclosure; as there are

many different expressions of energy manifest in motion in Space.

## The Feeling of Ease

The acceptance of an eclectic 'charge' and its fulfilment in unity is subjectively accompanied by a feeling of ease. That this should be the case is hardly surprising. We have already seen that through eclective action the organism finds that in the environment which is significant and appropriate for present utilisation in satisfying its functional needs.[1]

This leads us back to where we began this treatise – our definition of health. Can we now associate health with motility in Memory and Will? It seems so. Eclectivity which promotes a feeling of ease is one of the attributes of mutual synthesis on which, by definition, health has here been based. Ease is one of the outstanding action-patterns of health. It appears, for instance, in the infant as *serenity* – an action-pattern affording perhaps the most outstanding and sure 'sign' (to use a clinical term), of health. But in health ease is so natural, so deep-seated, that it is commonly taken for granted. Folk do not go about proclaiming their health, nor their feeling of ease in that state. Nonetheless, the appreciation of it is often both obvious and avowed where health – having been lost – is suddenly regained.

In this same context, '*dis*-ease' rises into prominence as the antithesis of the feeling of ease of health. But now, looking into Memory in association with Will, we can see disease in the light of a withdrawal from action in a field of unity; see it arising in retreat from motility in Memory; appearing in resistance to the discharge of eclectivity in Will.[2]

Sufficient has been said for it to have become evident that motility is associated with *feelings* in the individual. Important though that is, it does not get us very far; for, though commonly admitted to exist, the feelings are without clear definition in science. In exploration of Will the feelings cannot be ignored. The subject, however, is one which calls for careful examination. Fuller discussion of it must be deferred to later chapters.[3]

[1] Chapter v, p. 59. [2] Appendix 29. [3] Chapters xviii, xix.

Earlier in this book much attention has been given to the process of facultisation. We saw that it cannot be understood solely in quantitative terms: it has essential qualitative attributes not recordable on the materio-dynamic co-ordinates. But now that these qualitative attributes can be referred to their own media of quality, we have a foothold from which to view facultisation in its fuller meaning.

The outstanding characteristic of the process – that which distinguishes it from reflex action – lies in the specific relation of the environment to the organismal individuality engaging in action. In functional action, we have seen this specific relatedness to arise in a bipolar field of unity. Moreover, we found that it is from the field of unity that meaning, i.e. the qualitative appreciation of events, derives for the particular individual engaged in action. While the presence of a mechanism facilitating enhanced appreciation of events by stereographic action could be examined and in some measure appreciated, the 'origination' of the meaning nevertheless still remained obscure. Now we find two different media involved in the process of facultisation. Action takes place in Space-Time and in Memory-Will: the *means* accountable in the former; the *meaning* in the latter. In the association of the two, the essential co-relating factor is the field of unity in Will. This we shall see later. While the organism moves in Space and Time in obedience to the laws and regularities of that dimension, so also it moves in Memory and Will according to its own degree of qualification in Memory and acceptivity in Will.

The morphological basis in the organic mechanism for stereographs – i.e. action in fields of unity – is extensive indeed. We have noted the almost consistently paired features or organs of the body, both external and internal.[1] Further, we have disclosed a possible material basis in the organic mechanism for an external and an internal environmental threshold capable of yielding stereo-meaning from the dual poles, senses/feelings.[2] To this must be added the almost universal duality of sex – the faculty for genesis in organism in which each pole is an independent free-moving body, each competent to yield in mutual eclectic action stereographs of quality for the organism as an

[1] Chapter IX. [2] Chapter VIII, p. 93 et seq; also chapter XVIII, p. 208 et seq.

ethonological whole.[1] Then again, there is facultative action in fields of unity of each of the individual cells of the body with the body of their inhabitation. Lastly, there is the enveloping field of unity of organism and environment – expression of the prime faculty of organism[2] – yielding the overall meaning to the living entity in its inhabitation.

So then there are present for the organism the material circumstances making possible engagement in the qualificatory process arising with motility in Memory. However highly differentiated, however simple the structural features of any organism, all are instrumented to engage in motility in Memory and Will.

The process of facultisation is not the prerogative of man alone. It is a general feature of all functional action – in many scales of life, and on many planes of living. It is seen in action that is commonly called voluntary; seen, too, in situations over which the organism has no control. Still more, evidence of facultisation is to be seen in the development of organism, both ontogenetic and phylogenetic. All organismal living is involved in motility in Will. Motility belongs to the living world, as motion in Space-Time belongs to the physical world.

We live in Will as we exist in Time.

Nonetheless, motility in Will does not effect the materialisation of things, situations and events. Unlike motion in Space-Time, it is not *effective*: nor is it 'causal', inducing a chain of sequential events. On the contrary, motility spontaneously inducing fields of unity – so bringing together apposite diversities in Memory – is *orientational* of the content of Memory. So the *affective* attribute of motility in Will is related to the *effective* operation of the organic mechanism.

Motility in Will is spontaneous throughout wholes; hence it is a mode of 'energy' that is in essence *emurgetic* – from the whole.[3] Its manifestation in organism is thus to be anticipated as affective through the autonomous constitution of organism. This we have already seen to be open to emurgetic direction, through the 'freedom' of the parts in relation to their whole – a circumstance pertaining both to the organism as an ethonological whole, and to the organic mechanism.

[1] Chapter x, p. 111. [2] Chapter vii. [3] Chapter xiii.

In the field of unity induced by emurgy (Will) it would seem that (physical) energy pertaining to the material content of each functional pole, enters as it were into synthesis with the contextual emurgy of that field: this synthesis thus arising from contentual and contextual complements. So the synthesis of energy and emurgy, Energy-as-a-Whole, thus appears as a reality: but one unappreciable without recognition of the media Memory and Will.

But we are probing our way in unknown territory. In Space-Time there are no such circumstances to contend with. The basic entities of that dimension – the quanta – being in essence similar, are devoid of specificity and subject to no specific diversification. Hence any synthesis of energy-emurgy in that dimension must remain without particular significance.

The nature of motility raises yet another matter to arrest attention. The process of diversification in the memorial content appears to present no feature of hazard; for there is a 'certainty' attached to the exactness of specific association of apposite diversities in fields of unity in Will. Choice seems to inhere in motility and so appear as an attribute of Will. Such 'choice' pertains, of course, to the orientation of patterns in Memory: not to the operation of the organic mechanism. But since we have seen that in functional action the organism utilises Memory while it also utilises Space-Time factors, the necessary introduction into organismal action of a factor, choice, raises serious difficulties. Whatever the factor we may have to contend with, however, we have seen it is orientative; not effective in relation to organismal action. So, while in organism choice may prove to determine *how* that which avails is utilised, it has no part in the method by which materialisation is effected. Hence, the operation of materialisation as such is not encumbered with any consideration of the possibility of 'choice'.

There is still far to go in grasping the issue here raised in relation to organismal action. It is evident that choice is essentially associated with what are commonly called the 'feelings', for, as we have seen, the feelings arise in association with the process of qualification in Will. But the feelings – wayward, equivocal and intangible as they are – must await further attention in later chapters.

To the realm of Memory and Will, it now appears there must belong a *theory of specific eclectivity* – invoking choice. But we are in the realm of quality and qualification; as yet we know nothing of the co-ordination of quality and quantity. Some basis of reconciliation may yet be found allowing chance and choice to lie down together.

XVII

# Memory-Will

We have arrived at the necessity of envisaging two new media of cosmic scope: Memory and Will. Cursory though our treatment of each has been, it suffices to show that neither Memory nor Will, standing alone, can serve for an understanding of quality and the process of qualification. Just as the physicist seeking to understand the nature of mass and motion must think and speak in terms of Space-Time, so also in trying to grasp the nature of the memorial entities and their motility, as bionomists we must think and speak of Memory-Will as a conceptual *dimension*.

## Co-eclection in Memory-Will

In our approach to the medium Memory, its content was defined as that of the configurations of all the specific diversities and their specific wholes.[1] But looking at Memory in association with Will, the inadequacy of that definition immediately becomes apparent; for in the process of living new configurations are continuously arising in the memorial content.

Early in this text, we stressed the difference between objective and subjective specific synthesis but found that any such distinction escapes record on the materio-dynamic co-ordinates.[2] Now that we are in a position to refer the reality of qualitative diversification peculiar to subjective specific synthesis elsewhere than to the dimension Space-Time, the distinction between the two modes of synthesis acquires new pertinence. The difference lies in the respective use of the content of Memory in

[1] Chapter xv, p. 176. [2] Chapter v, p. 43 et seq.

each process. It is only in subjective specific synthesis that creativity – the realisation of new wholes in Memory – arises. It is to subjective specific synthesis, therefore, that we must turn for fuller understanding of accretion in the content of Memory.

Mutual subjective synthesis is invoked by motility in Will. The diversification that arises as a result of this mode of mutual synthesis is no mere addition to, or 'multiplication' of, the memorial content. It is not an aggregation of 'more' of the same; neither is it any repetition or permutation of the same; as, for example, in objective specific synthesis. Each new whole is a creation in Memory; a novelty, unique in quality with its own new figure of specificity. These new configurations arise in fields of unity in Memory-Will through spontaneous change throughout wholes. The change is one of quality and is not directly appreciable in terms of change in 'place' or in 'time'.

There is no appropriate word for this mode of qualitative change of pattern. It might be called *differation* in Memory-Will. The term has a certain aptitude since differation bears some relation (the nature of which is not yet definable with any exactitude), to the process of differentiation in organism as presently understood in biology.

In differation we are not presented with changes as in a kaleidoscope in which one pattern is superseded by a different one due to redistribution of the parts within a content that does not change; i.e. is conservational. In the creation of new wholes of quality in Memory-Will, each new pattern embracing the specific quality of that from which it derives, constitutes a further and new specific and unique configuration in the content of Memory. The specific identity of the parts entering into the new whole is not merely sustained, it is exalted in the mutuality of their participation in the synthesis by which the new whole is created.

We have already seen that Memory is peculiar in that the configurations of its content are ineffaceable. Nothing is washed out; no specific identity lost, as change after change ensues. Hence, with the creation of each new whole the content of Memory 'grows'. In no sense, then, is the memorial content 'given'; nor must it be conceived as merely 'conservational', as in the case of mass and motion in Space-Time.

Since no specific pattern is eliminated and no identity lost, it follows that there can be no 'past' in Memory.[1] But again, that is in no way to imply that the content of Memory is changeless. On the contrary, motility in Memory-Will might almost be said actively to resist *fixity*: i.e. non-diversification – just as motion in Space-Time restlessly effects new dispositions of mass in Space.

So it follows that no definition suffices from which it might be inferred that the content of Memory is 'at rest'. Though we may conceive of it as conservational in so far as nothing is lost, the memorial content is *co-eclective* by reason of its 'eternal' differation in Will.[2]

While then the physicist accords the attribute of conservation to mass and motion in Space-Time, to Memory-Will there must be ascribed the attribute of *co-eclection*.

## The Orientational Affect in Memory-Will: Bionomic Order

With some grasp of the nature of the content of Memory, it becomes easier to recognise the significance of qualitative events arising in that medium. Motility in Will, drawing together eclectively specific configurations that are apposite in the ineffaceable content of Memory, has an orientational affect in the memorial content.

So to Memory-Will there has to be assigned not only the dynamic properties pertaining to mutuality, fields of unity, spontaneity and so forth, but also an orientational dynamic, the affect of which is the spontaneous *ordering* of the content of Memory.

Natural law in Memory-Will would seem to be linked with order – through specific differation in the medium of quality. Order, with its attribute of uniqueness, is crowded with non-periodic diversities. There is room in it for specificity, for spontaneity, and for the 'certainty' of choice. The regularities of sequence pertaining to the materio-dynamic co-ordinates cannot permit of these attributes. But we must keep in mind that they all do enter into the picture of the functional action of organism. And, since we have seen that qualification arising in Memory-

[1] see Chapter XXII. [2] Appendix 30.

Will can influence organismal action, the possibility of the manifestation of this orientational affect entering into the materialisation of organism must be entertained.

Up to now there has been little to go on as to the origin of order. Though a subject which necessarily engages the biologist, it continues to elude explanation; or its explanation is accepted as residing and being fully accountable in the materio-dynamic sequences in which the organic mechanism may engage. We ourselves, recognising that order involves other factors than merely those deriving from the sequences of materio-dynamic system, have so far had to rely on the evidence deriving from the observation of action-pattern. Now at least we can see to what medium that evidence refers. If organism can be recognised as having a locus not only in Space-Time, but also in Memory-Will, and if the imprints of action-pattern associated with events in Memory-Will can be found in the materialisations of Space-Time, there arises some basis for renewed study of orientative factors that may underlie bionomic order. But that would be order, seen as the full expression of functional action of organism and environment in its locus in Space-Time *and* in Memory-Will.

## Usefulness of a Dimension, Memory-Will

The physicist has conceived of a cosmic Space-Time with quantitative properties. This has enabled him to understand, and in a measure to control, quantitative aspects of things, situations and events perceived from his personal locus in Space-Time. Certainly he does not 'see' geometry, nor atomic, nor relativistic phenomena in the circumstances immediately around him. But he does find it useful to think of such a conceptional cosmos *as if* it were there – even though he may not believe that it is there.

Similarly, here, we are proposing that the bionomist may find it useful to include in his thinking the idea of a cosmic dimension, Memory-Will, endowed with its own 'things', 'situations' and 'events' that can illuminate his own personal situation – that is, both in his own locus in Memory-Will; and also in his own locus in Space-Time.

By use of the dimension Memory-Will,[1] not only may the relationships of quality become discernable, but also their orientational affect in the materialisation of organism become apparent. It is to the functional co-ordinate we have postulated as a necessity for recording the qualitative phenomena peculiar to the process of living, that data drawn from this source are to be referred.

Bionomic order now appears as referable to the utilisation by the organism, by reason of a choice made in Memory-Will of that which the environment presents; not primarily to the methods pursued by the mechanism in achieving materialisation. It is 'how' the mechanism will be used that is ordered in Memory-Will.

For example, the mated pair, or family, as described in an earlier chapter, is seen now as a specific diverse 'reality' or ethonological entity in Memory-Will, and the process of the mating of these apposite specificities takes place in that medium even more surely than their conjugation as materio-dynamic entities in Space-Time. So, for example, separation in Space and Time now no longer makes for difficulties in understanding the essential qualitative nature of their mutual wholeness; for wholes have their own cosmic medium in which to form and to persist.

Then again, the idea of spontaneous action – qualificatory action – in any individual is not new: the notion that, within measure, we as individuals have a 'choice', is readily acceptable. But that such qualification should hang upon some factor spontaneously affective throughout the whole of which that individual is a part, is difficult to grasp in the absence of any understanding of the nature of qualitative wholes. But with 'whole' seen as a qualitative reality in the dimension Memory-Will, 'spontaneation' can at least be thought of as having its own dynamic yet to be explored by the bionomist. Similarly, the notion of fields of unity induced by eclectivity, can now be seen as inducing 'real' events; realities arising in their own appropriate cosmic dimension. So we are freed from the frustration of being tempted to locate such phenomena in the field of materio-dynamics into which they do not fit.

[1] Appendix 31.

Furthermore, the idea of autonomy is again one which can now be reconsidered as indicating features of the behaviour of wholes in Memory-Will. The parts of those wholes consisting of specific diversities (probably of all wholes[1]), are free, yet remain integral parts of their functioning whole. As long as that whole is involved in functional action and these 'free' parts remain in autonomous relation to that whole, so each part is permitted to enjoy appropriately wide excursion while at the same time permitting the same enjoyment to the whole in its encounter with further apposite wholes – in Memory-Will. This behaviour appears consistent with our limited personal view of Memory-Will – i.e. our own 'memory' and our own 'will'.

An instance of a recognisable whole is the family. Not only is there more or less a spacial aggregation or proximity of the bodies of the members of the family – its materio-dynamic parts – but the memorial specificities represented by the members of the family being enjoined in Memory there form a real, unique, memorial whole: an entity of quality. In this situation, however, each member of the family looks upon himself as an independent individuality – which truly he is – but that individuality is of significance only so long as he remains an autonomous 'part' in per-se relationalship to his ethonological whole.

These examples may suffice for the time being to indicate the usefulness of the concept of a dimension Memory-Will in facilitating the interpretation of observed phenomena in the here and now; as well as possibly assisting in the planning of fruitful experiment in this field.

It must be acknowledged that though the word 'wholeness' is in common currency, so far the notion has been difficult to grasp because, although it is clear that wholes are *not* materio-dynamic entities recognisable in Space-Time, there has been no guide as to how to think of their indubitable existence elsewhere. Indeed, could they be anywhere at all?

Certainly cosmic Memory-Will and cosmic Space-Time alike are but concepts. But they are both concepts intimately related to the personal here and now. Every entity has its personal locus in Memory-Will as it has its personal locus in Space-Time.

[1] cf. Chapter XXII.

It is from our own loci, our own 'real' and 'material' core in each dimension, that step by step, we can and do reach out to the actual as well as to the factual appreciation of things, situations and events.

Moreover, it must be repeated here that only in the quality of Memory can even the scientist recognise the very material with which he works; the material to which he so fruitfully can apply methods of quantitative measurement. *It is in Memory that every observer is related to his material.* Without that relatedness, things, situations and events in Space-Time can have no meaning whatsoever.

The issue, then, *is* a practical one. The conception of a dimension Memory-Will would seem to fulfil certain omissions in man's technical approach to an apprehension of truth concerning the living world.

XVIII

# Aesthesia

In this text the 'feelings' take a place of increasing importance. It was nevertheless inevitable that they should so far have been left without definition, for only at this juncture when a dimension Memory-Will has opened up the possibility of a direct approach to subjective phenomena in their own right, can some clarification of the issue be attempted.

It has to be faced: the feelings, being subjective phenomena, are utterly 'unreliable'. Open to no known form of measurement, they constitute a line of exploration strictly outside the contemporary methodology of physical science. It is perhaps for this reason that the general field they offer for exploration has remained un-named in science.

We propose to lift the feelings out of their present anonymity and to refer to the subject in general here as *Aesthesia*.[1] It will, however, become apparent as we proceed that what are commonly called 'feelings' represent but a small part of the content of aesthesia.

The word 'aesthesia' is no new one in contemporary use, for there has grown up a methodology claiming the status of a department of medical science – an-*aesthesia*. The modern world is all too aware of the ever-increasing variety of means of damping down, tranquilising and otherwise liquidating the feelings. It is perhaps curious that so much technical procedure should have been evolved for the elimination of 'something' the nature of which is relatively so little understood in science. Even the professional anaesthetist is not a student of the feelings: he would be the last to wish to be accredited with the title of 'Master of Aesthesia'.

[1] Appendix 32.

In the study of the living organism aesthesia cannot be ignored. The subject, however, is no easy one. To begin with, there is no accepted and clear understanding of the nature and scope even of those feelings which enter into our conscious appreciation. How are what we call our 'feelings' to be distinguished with any precision from what we call our 'senses'? The scientist, through his discipline and procedure, claims that it is possible to exclude the feelings from the field of experimental investigation. But that is a claim which merits close scrutiny; more particularly since scientific procedure includes the interpretation of findings as well as the matter and method of experimentation.

To attempt a precise distinction between feeling and sensation, which must be done before we can approach the subject of aesthesia, is no simple task. It is perhaps just with this that, undaunted, the modern poet, artist, sculptor, musician have been experimenting, so at times running the danger of evaporation of meaning.

Where shall we begin? We touch a piece of velvet: we 'shiver', maybe with ecstasy; that is to say, 'something' happens throughout our being. We have been *af*fected; we 'feel'. The affect is throughout the whole of ourselves – bionomically, spontaneously. Or, proceeding in another mode, we *put* our finger onto a piece of velvet; we 'sense' a pile. Now, *ef*fected by the pile, we are acting analytically; 'ergogetically' in sequence, through the mechanistic operation of a part of ourselves – the finger.

What shall we call the first mode of action – from the whole of ourselves: the poetic? In functional action the 'poetic' is as real as the analytic. Though the observer may fail to recognise the happening, I (to whom it happens) cannot. It might be said: 'I *feel*, therefore I am.' The fact is that in action both arise – the analytic and the poetic – if we are 'alive'. The poetic appraisal may be a shudder or a thrill of delight: 'I hate'; 'I love'; 'how ugly'; 'how beautiful'. The analytic judgment may be: 'silk'; 'cotton'; '1,000 fibres to the inch'; '100 to the inch'; '£10 or 10s. a yard'. In the second instance, the discriminative exercise of the so-called 'special senses' has obviously taken a prominent place.

Ogden's attempt to 'logicate' feeling (aesthesia) was perhaps premature, but it is in the right direction.[1] When our appreciation of an event is both of the 'poetic' and also of what is commonly called the 'practical', we are – spontaneously as it were – flooded with the poetic. But if we catch ourselves in the act, we are almost aware of the sequence by which the practical emerges and builds up to discriminate appreciation. Have we been moved by two distinct processes in the encounter? Are there alternative modes of accepting the offertory of sensibility?

Take another example: I am singing a song. It comes from inspiration? intuition? within me. Or, maybe as I sing I keep watching myself, 'measuring' for 'facts'; but I can only ever measure the outside, the surface of fact. Facts have insides – of music or whatever corresponds to music in seeing, touching, smelling, etc. A 'moving' sight; a 'delicious' feel; an 'intoxicating' bouquet. Things like that are *inside* all facts: kernels of quality; capable of novelty, of creation.

The 'insides' have proved immeasurable by any instrument of the intellect. Hence science has acquired the habit of examining the 'outer' shells, for that is the only way we know of trying to pin down conveniently the living essence of things, situations and events to prevent them moving off – *growing* – even as we examine them. In science, the inappropriateness of availing methods for examining the 'insides' being generally recognised, any attempt to investigate this aspect is largely eschewed; while in the last and most authoritative pronouncements in philosophy, the reapings of commonsense – which do bear the live kernel – are presented chopped and baled by logic, as though commonsense depended upon a purely intellectual exercise in pursuit of reason.

Like Spinoza, I am 'singing a song'. His logic may have been imperfect, but the inspiration in his song approached the 'heavenly', the 'divine' – we have no other words to describe feelings. Vague, then, though apprehension of this inner significance may be, it must be accounted as different from, opposite to, that produced by saying '2d. + 10d. = 1/–.'

There is no scientific recognition of this opposite effect. No

[1] *The Meaning of Meaning*. Ogden & Richards. Kegan, Paul & Trench (1923).

quantitative form of measurement for it can be found when examining the mechanism of organism. But whereas 'meaning' for mechanism is said to lie in measurement, meaning for living lies in a realm where Time is not and Space is not – where footrules are sticks for the lame.

It must be admitted that in this other realm of the inside of things there is 'something' – some methodology – which is analogous (not homologous) to logic; a methodology which makes the whole of the song in its seeming parts – which are not a-part – consistent. And, after all, consistency is the great virtue of logic; when we find consistency we suspect its derivation from logic. But in this other realm consistency does not stem from logic. It comes from that other methodology: the sort of thing the prophets – and sometimes our grandmothers – possessed in reaching their peculiar wisdom. Yet what is logic for if not to make plain the meaning? But logic knows nothing of the feelings: of aesthesia.

The inspiration – the vision that arises in this other methodology – is withal so 'real' that it *affects action*. Men may forego their livelihood; even give their lives for its unfolding. That it can unfold, finding expression in factual materialisation, is one of the indications of its reality. The history of the growth of science, as distinct from the growth of scientific technology, attests to this. It has often been an ever-present awareness – an inner 'feeling' – of the body of the unknown, that has impelled the scientist in his *search*. Intuitive wisdom even in scientific discovery may precede facultised wisdom. The intuitional factor could be the emotional translation of autonomous but as yet non-facultised responsiveness which, in evolution, may precede facultisation. The technician, on the other hand, manipulating the body of the known, must deliberately practice 'focus' to carry on his *re*-search in deep concentration. There is a place for both these modes of action – for search and for re-search – in science.

In this text, we have already had to recognise feeling as being associated with eclectivity in the dimension Memory-Will. We have, moreover, reached the position in which properties that have no place in the Space-Time dimension and for which there has been no description other than the poetic – these very

aesthetic properties – can be recognised as *realities of quality* and so be examined in the light of Memory-Will. The distinction has been made between the realities of Memory-Will and the materialities of Space-Time.

It is a well established fact in science that it is through the sense-receptor organs of the body that we 'sense' things – situations and events as they hit us from without-in. We 'acquire' our income from sense-reception, or what we call our 'senses', in doing so sharing the property of sensation with all other living entities (indeed, with the whole materio-dynamic world of things). There is nothing either unique, individual or personal in sensation, from which our senses derive. Our feelings, on the other hand, come from within us. They are peculiarly our own; specifically – i.e. qualitatively – related to ourselves. They are woven into our individuality; and for that reason can have but a very limited and personal commission.

Then again, our senses are strictly confined to the 'here' and 'now'; they inform us – it is usually presumed – of the 'what' and the 'where' in the here and now. But our feelings are not by any means referable only to the present; they can arise out of what we call our 'past'.[1] They have a timeless quality – are spontaneous in action. Spontaneity is 'quicker' than any sense-receipt; the difference is as between the 'quick' and the 'dead'. 'Quickness' is in the feelings of the living entity – in aesthesia. Then again, if we lose our feelings, they cannot be 'found' by anyone else; and that constitutes one of the major difficulties in their scientific exploration.

We have already seen that not all that impinges on the external surface of the living organism enters into mutual synthesis in the progressive action of that particular organism: i.e. not all is qualitatively co-eclected for use by the organism. In the process of mutual synthesis the sensory intake from the environment is enjoined with a contentual complement from within the individual whereby the sensory accretion is qualitatively related to that individual. This process of qualification – which we now find derives from the individual's locus in Memory-Will – lies in the association of a specific complement from within with an appositely specific complement from with-

[1] Appendix 33.

out. Essentially, this synthesis is one of the 'self' with the 'not-self'. Studies of tissue-culture, immunology and virology confirm that the contentual contribution coming from within can be no other than one homologously specific to that entity.[1]

The contextual contribution is drawn from a heterogeneous source, from amidst which only that which is already analogous or congenially specific to *that* entity is acceptable for utilisation. We are aware of this in everyday action. At a party, for example, we find ourselves naturally, i.e. spontaneously, migrating towards the familiar, and avoiding the unknown – though our discretionate action may quickly overcome the initial impulse to move only amidst the familiar. So, in functional action acceptance hangs upon a qualitative factor coming from within the individual and related to the specificity of pattern of that individual. (But we are now in the dimension Memory-Will.)

Having already found in the process of mutual synthesis an association of the contentual complement with the feelings, which here we are including in the general term 'aesthesia', we can go back on our tracks. In place of the generalisation on the bipolar field of organismal action previously made in the vague terms 'senses'/'feelings',[2] we can now say that functional action in all facultisation arises in a bipolar field of unity, the poles of which are *sensation/aesthesia*.

On first sight, this shift in wording may appear of little moment. It implies however an important distinction that must be made between the feelings and aesthesia. 'Feelings' obviously refer to something we are aware of. We say we are 'conscious' of them: we 'feel' them. But now we are associating aesthesia – whether consciously appreciable or not – with that which comes from *within* the organism as an essential component of all mutual synthetic action. This shift in wording thus implies an immeasurable extension of the range of aesthesia beyond the relatively few feelings of which we are aware.

In the case of sensation, where available knowledge is very considerable, the stage has long passed when credence was given

[1] see particularly Sir F. MacFarlane Burnett, *et alia*. *Enzymye, Antigen, Virus*. C.U.P. 1956,

[2] Chapter IX, p. 103 et seq.

*only* to the effect of sensation of which an individual is conscious; sensation is well-recognised as operative over a vast field of which we may remain wholly unaware. This can readily be appreciated in the various degrees of anaesthesia, where not only is feeling eliminated but where, without interfering with all sensation, it may be necessary for surgical convenience progressively to eliminate degrees of sensation of which the subject is not conscious.

Just as sensation is not cancelled out where there is no consciousness of its passage, so likewise we are not called upon to discount aesthesia where no feeling rises to the surface of our personal appreciation. Much modern psychology rests on this premise. The sense-reception we are aware of and the feelings that we are conscious of form no more than a thin surface-layer supernatent upon the abounding flow in the organism of sensation on the one hand and of aesthesia on the other.

## The Origin of Aesthesia

We can now give closer attention to aesthesia in terms of reference to Memory-Will. We have already had a major encounter with the feelings – aesthesia – as a manifest of motility in that dimension.[1] We saw, for instance, that profound feeling may accompany thought which happens within us – a subjective phenomenon pertaining to the emergence of new configurations in Memory-Will. We also found objectively recognisable events, which have their qualitative counterpart in Memory-Will, accompanied by superlative feeling, as in the process of courtship and mating, where the feeling content becomes manifest in action-pattern.[2]

There are, then, events recognisable in the Space-Time dimension which are pre-eminently associated with aesthesia and hence co-ordinated with 'events' due to motility in the dimension Memory-Will. But there may be no essential time relation between them. In the feeling associated with thought, years may pass before overt materialisation of that thought ensues. Aesthesia appears to arise anterior to – as well as being participant in – Space-Time materialisation. Tentatively, then,

[1] Chapter XVI. [2] Chapter X, p. 128 et seq.

we must assign the *primary origin* of aesthesia to the specific disposition of patterns in the dimension Memory-Will.

It is, perhaps, the intuitive recognition of just this distinction in the origin of motivation that the artist is making when he distinguishes so emphatically between the 'creative quality' of a work of art, and the product of a labour of representative 'art'. For him the latter is bereft of interest; 'leaves him cold'. His own aesthesia, well developed in terms of quickness of feeling, apparently enables him to distinguish between a record of lively change in Memory-Will, and that of mere formal changes in a kaleidoscopic picture of events drawn from the materialities of Space-Time – in which aesthesia may take no part.

Eclectivity in Memory-Will that induces aesthesia, finds expression in many different scales and different degrees of intensity; and also in different modes of expression. Awareness of its 'pull' may be pleasurable – or painful. We may say we 'like' or 'love' the apposite to which our own charge of eclectivity impels; or we may say we 'dislike' or 'hate' that from which we are repelled. Indeed, to 'hate' is but to love 'wrongly'. We should pass by, not be repelled by the encounter – unless we were already in some way specifically related to the subject of our 'hate'. We hate – in spite of our specific relatedness – because we are without the facultative ability to achieve any mutual synthesis with that entity. To find a basis for mutuality, we might have to drop down to the lowest rung of the ladder of our own specific constitution – which we resent.

Having associated the *origin* of aesthesia with qualitative patterns in the medium Memory-Will, we can now make a further generalisation. While sensation is the accompaniment of changes in quantitation due to motion in Space-Time, *aesthesia arises with changes in qualification due to motility in Memory-Will.*

It may well be objected that to attribute aesthesia primarily to the dimension Memory-Will is no more than tacitly to accept the position of almost total lack of exact knowledge which at present prevails. In other words, that when full investigation has disclosed – as no doubt inevitably it will – the quantitative materio-dynamic processes in the body to be correlated with

aesthesia, any such deduction as we are now making will prove superfluous.

The answer to this objection is that, though there already exists full and exact knowledge as to the paths and processes (physical and chemical) by which the body carries on the sequence of materio-dynamic events associated with the sensory impacts of the environment, it still remains to be known *how* those sensory events are converted into sense-perception in the living entity. This was the question we were confronted with in examination of the faculties. In discussing facultisation we found that in the living individual the interpretation of sensory receipts derives from their association with the specific constitution, or 'individualisation', of the recipient.[1] But that very 'individualisation' is a factor avowedly not assessable by quantitative estimation, or where uniqueness is not accountable.

It is, then, not for an understanding of aesthesia *alone* that it is necessary to seek new terms of reference. They are also essential for a full understanding of the effects of sensation – but only, of course, when that is studied with reference to the living organism.

We are associating aesthesia – which vitalises and gives meaning to all the faculties – with qualification in Memory-Will. In this association lies the distinguishing mark between physiological 'fact' and bionomic 'act'.

But where then are we to look for the material manifestation of aesthesia in the organic mechanism?

## An Aesthetico-Directive System in the Organic Mechanism

When an artist sits down before a copper plate, he projects a qualitative memorial reality onto that plate; then he proceeds to etch and to bite into its surface his projection of that quality in terms susceptible to quantitative measurement. In some such way it appears that the living entity – with imperience of apposite specificities in Memory – bites quality into the chemical and physical constitution of the tissues of its materio-dynamic body.

Since aesthesia – which we have seen deriving from motility of apposite specific patterns in the content of Memory – is

[1] Chapter VI.

capable of affecting the *action* of the living organism, it must somewhere and somehow be imprinted on the organic mechanism.

In early chapters much attention was given to the nature of the faculties. We saw that facultisation can only be understood in terms of synthesis of context/content which, by mutual mutation in a field of unity, yields meaning to facultisation. In principle, the poles of that field of unity we have already seen to be sensation/aesthesia.

In the material constitution of the organic mechanism we are well advised from whence the contextual complement – sensation – derives. How that complement from without is transmuted by an elaborate and well defined sensory-motor system in the body is well established fact. We are now faced with the question as to where and how the imprint of aesthesia is impressed on the bio-physical and bio-chemical constitution of the organic mechanism. Is there some site, some membrane or system where this translation is brought about?

What has to be sought is the 'receptor' surface in the organic mechanism sensitive to the imprint of aesthesia. When discussing the internal faculties of the organism, we put forward at some length reasons for assigning to the adult body a well-defined and extensive internal threshold of exchange.[1] This internal threshold is constituted of membranes deriving from the embryonic yolk sac which, penetrating the body of the embryo, ultimately become incorporated into the tissues of the adult body. These derivatives of the original yolk sac, lining the fore, mid and hind gut in the developing embryo, persist in the lining of important structures such as the gut and lungs and in their development come to bear 'special features', or internal organs, e.g. the thyroid, pituitary, etc., supplied with their circulatory system and nerve circuits linking them through the internal autonomic nervous system with the brain.

In this association of membranes and structures situated deep in the body of the organism, we are presented with an internal membranous surface bearing the essential morphological characteristics to warrant its recognition as an internal system in the body.

[1] Chapter VIII, p. 92 et seq.

Have we here what we are looking for? Bearing in mind that the impacts of sensation deriving from the environment are translated and transmitted throughout the body by means of the well defined sensory-motor system, can this internal system be that which takes the imprint of aesthesia, converting it into material for use by the organic mechanism?

Acting on this assumption, let us review the morphological disposition of this internal system – whether in the ovum or in the adult body – in the light of functional action in the organism's locus in Memory-Will.

In the relatively simple shelled egg we are presented with an embryo – conceived in Memory-Will as it is conceived in Space-Time. It carries with it its memorial inheritance – genetic and nurtural – embracing the patterns of phylogeny as well as those of the locus of its own presence in Memory-Will.[1] The ovum is thus involved both in the quantitative impacts of sensation from without and in the qualitative impacts of aesthesia from within.

In the case of the ovum within its shell, where the morphological structure is minimal, there are two membranes only which could serve as receptor surfaces. One is the outer encircling membrane of the ovum; the other the internal membrane enclosing the yolk substance. While the ovum has had no part in the accumulation of its enfolding 'white' – the impact from without – the internal yolk substance it has accumulated and taken into itself. This is substance that it has liked, has chosen; i.e. it is what it has moved – motilated – towards eclectively in its locus in Memory-Will. This brings it aesthetic *imperience* mordant upon the constitution of the material within the sac.

Its yolk substance lying within the ovum must be specifically homogenised in quality. Hence this store of memorially patterned material might be conceived of as a template of the *self*, providing the entity from the beginning of its career in life with a (material) criterion of quality *fitted to its own needs*. So the yolk substance could well be a guide – associated with aesthesia – to the qualification of its future synthesis. It must be recalled that the yolk substance has been accumulated in that ovum *before* it set out to grow; indeed before its fertilisation by the male

[1] Chapter xv, p. 173 et seq.

sperm. The template collected before the work of synthesis begins!

If this secreting membrane, which accumulates the yolk substance in the ovum, is the 'plate' on which that artist – the living entity – projects the qualitative memorial realities of its locus in Memory-Will, then we can recognise the yolk sac – to which no functional significance has hitherto been attributed – as the *primitive organ of aesthesia.*

The burden of search for evidence of the imprint of aesthesia on the organic mechanism must not lie too heavily on the delicate structure of the shelled egg alone. But when in the adult human body there can be traced a series of structures arising from the derivatives of the embryonic yolk sac, we are obliged to give serious consideration to the clue gathered from the fragile egg.

What evidence is there that this internal morphological system in the adult body is, in fact, an any way associated with aesthesia?

The first indication of such an association lies in the function of organs that have developed from its membranous surface: for example the thyroid, thymus, pituitary. Each one of these is an endocrine organ known to be associated with the emotions – with aesthesia. Moreover, these organs have an orientating or directive role in synthesis occurring in the organic mechanism. This is particularly evident in the function of the thyroid, the action of which does not *ef*fect but *af*fects synthesis by exercising a directive control on the metabolic processes in the body mechanism. The pituitary is perhaps still more outstanding in its regulatory attributes in the body economy.

Accepting this interpretation of the significance of anatomical dispositions known to exist in the body, there is then at hand and open to investigation what we may call an *aesthetico-directive system* in the organic mechanism developed from a well-defined internal threshold of exchange.

This internal morphological system has attributes whereby eclectic events in the organism's locus in Memory-Will could find expression in material changes in the substance of the body. It holds the functional potentiality for the accumulation and distribution of material bearing the qualitative imprint of the

'self'; again in the nature of a template for the orientation of synthesis in the organic mechanism according to the specific needs of that unique individual.

## Two Thresholds of Exchange

In this way we are presented with two well defined thresholds of exchange in the organic mechanism: one external, one internal, from which to draw the materials for synthesis. These are represented by:

(a) the external integument with its differentiated features or organs associated with appropriate nerve connections forming a sensory-motor system; and

(b) the internal membranous threshold with its differentiated features or organs and associated nerve circuits, forming an aesthetico-directive system.

The first of these, the sensory-motor system of the body, is occupied with the results of sensory impacts upon the organism deriving from its Space-Time locus; the second, the aesthetico-directive system, occupied with impacts associated with aesthesia deriving from the organism's locus in Memory-Will.

Together, these two systems could provide a material basis in the organism for the process of mutual subjective synthesis arising in a bipolar field of unity: sensation/aesthesia. The requirements for all facultisation in the organism would thus be fulfilled.

Great as is the living organism's *ex*perience of sensation, so no less is its *im*perience of aesthesia. It is known that in the sensory-motor system there are appropriate means for the acceptance and transmission of experience deriving from the external environment, and also for storing in the brain records of such previous events for future use. It would seem likely that the aesthetico-directive system we have here delineated, fulfils analogous conditions for the reception, transport, recording and storage in the brain for future use of aesthetic imperience.

We have had frequent occasion when earlier considering the faculties, to refer to the 'sensibility' of organism. It is well recognised that sensibility is responsive to the impacts of motion in Space-Time (sensation) through the external threshold of the

organic mechanism. Now we are suggesting that that same basic sensibility of organism is equally responsive to the impact of motility in Memory-Will (aesthesia) through the internal threshold of the organic mechanism.

Sensation and aesthesia impinging on the sensitivity of the living organism, constitute for that organism on the one hand a quantitative income from the environment assessable in terms of Space-Time; on the other hand, a qualitative income derived from the locus of the organism in Memory-Will. How to assess this qualitative income remains to be learnt. Approach to it requires a functional co-ordinate.

To associate aesthesia, as we are doing here, with an organised system in the body mechanism, must not of course be taken to imply that the *origin* of aesthesia will be found to be in the material constitution of that mechanism – any more than sensation originates in the sensory-motor system. Indeed, it is now accepted that sensation is a universal attribute of all matter. We must regard aesthesia – originating in Memory-Will – as no less universal in its potentiality.

# PART III

XIX

# 'Feeling' Our Way

## Faculty for Recollection

Earlier in this text, when examining the nature of the faculties and of facultisation, we found that although the infant at birth is equipped with a full complement of sense-receptor organs it has not yet the functional capability to use them.[1] How does it act before its capability for using its sense-receptor apparatus has become facultised?

In the newborn, the first impelling urge that we become aware of is that which draws the baby to its own mother's breast – and it must not be overlooked that the mother is likewise 'drawn' to her baby. The incentive to action is mutual. This phenomenon is commonly called 'love'. Now we can refer to it in terms of the qualification of action by eclectivity in Memory-Will.

Mother and baby constitute one of the outstanding functional bipolar 'fields of unity' in which there lies the basis for the eclection of apposite patterns of specific diversity in Memory-Will. In this zone of mutuality the mutual recognition of functional needs is accompanied by an appetite for unity; and fulfilment of those needs by a feeling of ease – both expressions of aesthesia.

In this its first clearly defined action of seeking the breast, the infant is commonly said to be seeking what it 'likes' – what it 'loves' – for the woman in the home has none of the hesitation we may have in attributing 'feeling' to the baby. In terms of Memory-Will what the infant so definitely singles out in its

[1] Chapter VI, p. 70.

quest is just that which can fulfil its immediate functional need in terms of quality. It has a recognition of congeniality or 'familiarity'; it 'recollects' that which will fit qualitatively its own specific pattern.[1] This evidence presented by the action of the newborn, leads to the deduction that at birth it is already using some faculty by which it can recognise patterns of specificity in Memory: let us call it the *faculty for recollection in Memory.*

This faculty is apparently competent for action at birth. In this respect it appears unlike any external faculties of the organism. While, for example, the newborn cannot recognise its mother by sight, it can and does recognise her by this other faculty. The functional use of the sense-receptor or external faculties is in fact only acquired by the progressive cashing of sensory receipts in the bank of Memory. We saw this in our walk through the country lane. In other words, the successive sensory impacts acquire meaning for the individual only when matched or mated with that individual's own memorial content. Into this process the faculty for re-collection enters.

Wherever the locus of the faculty for re-collection may be found in the materialisation of the embryo, its *origin* comes from within; not from 'experience' of external impacts on the entity, but from 'imperience' or internal apprehension of the specific configurations in Memory pertaining to that growing individuality. It is a faculty to be associated with the entity's locus in Memory-Will.

It is only necessary to watch the rapidity of movement of, say, a piglet barely born, to its sow's teat, to realise the sureness with which the newborn 'knows' its way about in Memory-Will. It recollects specificities presented to it through its mother – in whom are gathered up not merely specific patterns referable to the phylogeny of pig, but patterns specific to that piglet in its embryonic life. It uses its faculty for re-collection to guide it by the shortest route to that which is meeting its functional needs – eclectively. This is the interpretation of events in terms of Memory-Will.

[1] Chapter xv, p. 172 et seq.

But why go out of the way to postulate anything more than use of one of the well-accredited avenues of sense-reception: for instance, the sense of smell; or, if not smell, some other factor yet to be discovered operating on the sense-receptor mechanism of piglet or of its mother?

In this connection we must bear in mind that the external faculties are developed from all-purpose tools – body cells – and that these tools can be employed without relation to the specific needs of functional action. The body mechanism, of which the external sense-receptor organs are parts, is essentially an automatic reflex 'engine', and as such can operate as pure mechanism. For example, the newborn (piglet or infant) can and does automatically suck anything which fills the mouth. Even an unborn foetus will do so. As a physical entity, the body mechanism can operate automatically – i.e. in the sequences of materio-dynamic system – without discrimination. Thus anything neutral, anything which does not arouse aesthesia – a glass rod, a rubber teat – will set it operating; for the *capacity* to suck is *in the machine* – though 'knowledge' of what to utilise the sucking for *is not in the machine*.

But the infant (or the piglet) at birth already has knowledge of how to use its capacity for sucking – discriminately. Only let it be hungry – feel hunger, i.e. be flooded with aesthesia (which it will be a few hours after birth), and it will stop sucking anything and scream for *what it needs*. Some factor has obviously intervened to change the direction of operation of its mechanism – *as pure mechanism*. When a feeling – its aesthesia – intervenes, it rejects the object that started the reflex operation of its mouth. Once again, aesthesia can influence the *direction* in which action is taken, without altering essentially the sequences by which that action is fulfilled or materialised.

But that is not all: even yelling with the feeling of hunger, the live infant will by no means take anything edible that is offered it, though, as we have seen earlier, its stomach and guts already at birth have the capacity to digest adult food. The mother's breast clearly has 'instant' meaning for her baby at birth. In terms of Memory-Will, 'instant' must be translated as 'spontaneous', i.e. acting throughout the whole or unity of mother and baby. In their field of unity each has appetite for

the other; each is eased in mutual satisfaction of their functional needs. Both the appetite and the easing are of aesthesia.

## Faculty for Eclection

A second fact has now entered into the picture. The infant already has the capability to reject or to accept; i.e. to '*choose*'. What does it, in fact, 'choose'? What it 'likes' – its *own* mother's milk, i.e. that of a quality of which it already has aesthetic imperience and which it can re-collect in Memory. Give it something edible but foreign to it – uncongenial, i.e. not of a group-specificity it already 'knows' – and its face puckers, it struggles and its whole body may even go into a generalised convulsive revolt, spitting out that unfamiliar substance it *dis*-likes. The baby will only take its own – not even another – mother's breast, *if given the choice.*

That is not to say that it cannot be induced to forego the choice its aesthesia has 'taught' it: cannot be induced to take a substitute – *when choice is denied it. Pace* Lorenz.[1] However low on the ground Lorenz were to bend himself, however cunningly he quacked before a duckling newly-hatched from under its *own* mother and in the presence of that mother, transference of the duckling's allegiance to him would not occur. It is aesthesia, associated with the discriminate and mutual satisfaction of mutual specific needs, which directs the duck to its duckling, and the duckling in line behind its mother. But aesthetic directive will not alter the materio-dynamic sequences by which it walks – no matter behind whom or what. Deny choice, and aesthesia is put out of action. Then the organic mechanism takes control and almost anything can be made to happen – except – per *choice* – the emergence of bionomic order.

The operation of the organic *mechanism* is not to be stayed till death intervenes. Once having received the imprint of Memory-Will no matter how early in its development it (or any part of it) can continue to operate in the action-pattern associated with that imprint without further present accretion from its locus in Memory-Will. It is these facts which make it possible for the biologist or physiologist to experiment with mechanism as

[1] *King Solomon's Ring.* Methuen & Co. London 1952

though the mechanism represented the organism-as-a-whole and, by conditioning the object of his investigation, achieve 'consistent' results. But the consistency of the results refers to the prescribed frame of reference of the experimenter. Confusion in interpretation of observed events arises when the full implication of the limitation of the frame of reference is not recognised, so that the consistent results are assumed to be referable to a functioning organism exhibiting biological order.

There is then yet another internal faculty associated with Memory-Will – the faculty for *eclection.* It is concerned in utilising from the general supply that which meets the organism's own peculiar and unique needs.

So we come to the following position:

(a) *The faculty for re-collection* is exerted on the specific configurations of the content of Memory referable to the specific constitution of the individual possessed of the faculty.

(b) *The faculty for eclection* is exerted through eclectivity in Memory-Will in the mutuality of functional action of that particular organism and its inhabitation.

Both faculties are dependent upon the locus of the particular entity in Memory-Will. Of the two, it is the faculty for eclection which bears reference to the spontaneous *creative* quality in facultisation.

It is important to recognise that exercise of the faculty for eclection need not continue to be exercised in the continuous operation of the mechanism once that operation has been qualified by the initiatory action of that faculty. While at birth, as we said earlier, the knowledge of what to use the sucking for is not in the machine, such knowledge is initially imparted to the machine after birth by co-eclective action in Memory-Will. But once that particular specific relationship has been confirmed in the organic mechanism, the machine can then continue to repeat that action, even if the faculty for choosing is henceforth inoperative.

So it is necessary to look with care into the use of the two faculties. The faculty for eclection involves exercise of the faculty for recollection. Without power to recollect in Memory the

apposite to that which is presenting, there can be no eclective motility engendering creative subjective synthesis, and hence no consequent aesthetic increment in the organism. Where, however, 'rememorability' has been impressed upon the organism, or any part of it, repetition can continue indefinitely without the acquisition of further aesthetic imperience. While aesthesia accrues in the origination of the imprint, no aesthesia is necessarily to be anticipated in its repetition.

All facultisation – like growth – is irreversible: though it may not be progressive. So, for example, if at any stage the action of the internal faculty for eclection is stayed or withdrawn from the organic mechanism, that mechanism in its operation will still manifest the characters that have been impressed upon it by qualificatory attributes in an earlier phase. But no further novel quality will ensue in the operation of that mechanism unless and until the faculty for eclection again intervenes in action. The implication of this has to be reckoned with in the interpretation of action-pattern as observed in organism. It also has pertinence with reference to the statistical assessment of organic action.

Once the organic mechanism has been set in operation, re-collection from the illimitable content of Memory can go on automatically – as in the cybernetic operation of a machine. So it is clear that *automatic use can be made of the content of Memory.*

Hence action originating in Memory-Will has to be distinguished from the operation of the organic mechanism which can repeat indefinitely that which initially has been derived from Memory-Will. In one case action will be consistently associated with aesthesia: in the other it will be devoid of present imperience of aesthesia – without 'love'.

Very, very few adults act in bipolarity of sensation/aesthesia – from without/in and from within/out; few are affected by their aesthesia as they see, hear, touch, smell. The reactions of the majority are mostly sensational. Their *feelings never having been facultised to 'finger-print' materio-dynamic operation, their action is not stamped with their full individuality.* We can apparently waste eternity as easily as we can waste time.

Some knowledge of the feelings – aesthesia – can be drawn from therapeutic and pharmacological sources. Anaesthetics

and drugs yield evidence of events as they appear when aesthesia is in a measure withdrawn from the individual's field of action. There are drugs and anaesthetics which eliminate our 'love' and 'liking' for things, so that the power of choice associated with aesthesia is thereby eliminated, leaving the subject to operate the content of Memory fortuitously; or automatically throwing him back on mere reflex-action. There are also anaesthetics which rob the subject of his power of re-membering – i.e. recollecting the content of Memory. Then, unable clearly to distinguish 'what he likes', he becomes confused in action. These are agents which, in varying degrees, dissociate his being in Memory-Will from his existence in Space-Time.

Pathology affords another source of information on the subject: surgery of the endocrine organs and of the brain; exploratory surgery of the brain and central nervous system; medical disorders of many types and disturbances of the mental states of patients. Though indicative of organs and structures involved in aesthesia, they however yield little information as to the origin and nature of aesthesia.

Some forms of mental deficiency throw light on the significance of the co-ordination of Memory-Will and Space-Time in functional action. Let us take an example drawn from a pathological situation. Present a certain type of mentally deficient child with a bright and delicate flower. Its face will suffuse with a *risus hystericus*. Instantly it will grasp it, smell it (or put it to its nose), and the next minute crush it to pieces with all its clumsy might – and with equal display of hysterical and uproarious laughter. It sees, smells, with its sense-receptor apparatus – it crushes with its muscles in uncontrolled reflex-action. It would seem that the child can recollect postures – possibly even those exhibited by others – in connection with the object, but it uses these recollections in its memorial content without the orientational directive in Will with which aesthesia is associated.

In the absence of aesthesia the titivation of the sense-receptor mechanism and the operation of the physical powers of motion are relegated to those of the automatic quantitations of *mechanism* uncorrelated with any qualificatory motility in Memory-Will. In the child's action-pattern there is no 'love'; no eclectivity

has presently entered into its action. Without such correlation of events in Space-Time and Memory-Will, the child has no means of relating the sensual impact of the flower to any growing facultisation in its person: nothing to lead to any progressive discrimination in the operation of its muscle power. Being deficient in eclective motility, the means are absent of *directing,* or of orientating the power of the organic mechanism to discriminate and meaningful use.

Looking at aesthesia in more general terms it can be recognised, for example, that whereas, physically, sound emitted from the larynx 'makes a noise' by chance, in functional action sound becomes speech through choice, depending on aesthesia. 'Touch' makes a 'tactic'[1] by chance; aesthetically it makes a 'strategy' – by choice.

In these examples, aesthesia is not by any means necessarily expressed in feeling. Though we may recognise – if we think about it – that we have 'chosen' to speak rather than to make a noise, we do not go about aware of, proud of, our choice. Nonetheless, it is the 'choice' arising in qualification in Memory-Will associated with aesthesia which directed the action whereby we learned to speak, and by which we continue to speak meaningfully. But here again, once the faculty for speech has been acquired, it may subsequently be used in meaningless reiterations.

Hence in looking for evidence of aesthesia, action arising from the use of the faculty for eclection has to be distinguished from action invoking the use of the contents of Memory automatically, without reference to the orientational affect deriving from the faculty for eclection.

In general terms it might thus be said that the study of aesthesia in the living organism raises the question of how 'choice' uses the 'chance' of the physical world.

The involvement of a 'choice', means that we are moving in a field strictly closed to pure science. Though it may be no new field to the poet, the painter, the musician, its experimental approach is beset with extreme difficulty. For example, in so far as the major evidence of aesthesia is subjectively appreciable, that evidence is non-admissable. Nor can we rely on reported

[1] Gr. *tattō; tassō,* to arrange.

accounts of it by the subject, for disaccord between speech and action is proverbial. The method of 'question and answer' may suggest clues for investigation, but it is unacceptable for the compilation of critical records. A further difficulty lies in the fact that scientific technique demands the isolation of the object of investigation and 'controls' for experiment. These are not easy to devise where spontaneity is involved. Moreover, while it is presumed to be comparatively easy to keep the feelings out of the picture in any study of sense-reception, it is incomparably more difficult to keep sensation out of the feeling picture.

A less obvious but even more serious handicap is the fact that for the last three hundred years – the Newtonian era and the Age of Reason – *the 'feelings' have been progressively in discard.* During that time, the study and cultivation of sense-reception and sensation has become the almost exclusive preoccupation not only of the scientist, but of the academician, the schools and education in general. The feelings, left to wilt from neglect, have failed to *become facultised.* So, strong and spontaneous though they may be, it is to be anticipated that in the many forms of action open to casual observation, their expression lacks nicety of discrimination. This accords with the general belief in their 'unreliability'.

So the task before the would-be experimenter in the field of aesthesia is onerous. However carefully he may plan his methods of observation, before reasonably hoping for reward he may have to start from scratch – even to the length of having to 'grow' his material, finding for himself circumstances in which aesthesia may become as developed and discriminate as is sense-reception.

The existing technology of the physical scientist then will not serve for the investigation of aesthesia; except insofar as co-relation becomes necessary. But that is at the *end* and not at the beginning of the journey. Entirely new technique has to be envisaged.

The species, man, as we have seen, affords the most likely material to yield results from observation in this vexed field. The fact that the span of man's facultative development is perhaps longer than that of any other species, does necessarily constitute a serious handicap if the material suitable for the

observation has to be 'grown'. But man can yield evidence of affections, emotions and feelings; and though his feelings are likely to constitute but a fraction of his aesthetic content and potentiality, he can at least give testimony to them – for what that is worth.

Possibly when more is known of how to recognise and how to assess aesthesia, a more faithful portrayal of its functional co-ordination with sensation will be found in observation of the lower species in their natural habitat; for there the possibility of the direction of action merely by the intellect – their's or man's – does not intervene.

## Aesthesia-Paraesthesis

In the study of aesthesia, man presents peculiar difficulties other than those already referred to. Not only may the aesthetic faculties remain rudimentary, shrivelled and shrunken, but just as man can either use, lose or ignore his external faculties, thereby leaving them unfacultised and undeveloped, so the same can happen to his internal faculties.

When he loses or ignores his faculty for eclection, i.e. becomes *un-willing* in Will, he foregoes autonomy in Memory-Will. With loss of motility, he loses orientational directive, so inhibiting the expression of spontaneous order in his action. Then, released from directive, the faculty for re-collection takes over and operates on the content of Memory, automatically: i.e. without reference to eclectivity. Using this faculty alone, he can only recollect what he already knows. So he proceeds by repetition, using recombinations and permutations of his memorial re-collections. Having foregone co-eclection in Memory-Will, the syntheses so made without the orientating affect of aesthesia – objective syntheses – are devoid of further creativity.

The issue is even more complicated. His power of re-collection has included recollections of specific postures associated with aesthesia previously imperienced. These postures he can incorporate in the synthesis he effects by reiteration, and so his behaviour may have the *appearance* of action still directed by aesthesia, though it is not in fact *presently* so directed. Man's behaviour is thus equivocal and requires careful and critical scrutiny.

When not presently initiated by aesthesia, though infused with the recollection of aesthetic posture, the resulting behaviour is commonly called 'sentimental'. The process can go further. In a given situation an individual, recognising a posture indicating aesthetic content in another person, may – consciously or unconsciously – re-collect that pattern of action and reproduce its effigy in his own behaviour. This situation is well-known to the clinical psychopathologist: but such a 'deception' may remain undetected until announced by clinical breakdown – a symptom of disorientation in the individual's locus in Memory-Will.

When the sense-receptors and/or sensory motor apparatus suffers injury or is discounted, the condition is recognised as 'paralysis'. When aesthesia is lost or ignored, the condition should be recognised as *paraesthesis*.

The essence of paraesthesis so defined, lies in the absence of eclectivity in Memory-Will. There follow loss of autonomy in the individual and consequent loss of orientation of the directible organic mechanism. When the power of circumstances plays upon an individual who is without directive as to what to choose to meet his functional needs, his circumstances then hold for him all possible chances: so arises the threat of chaos. In retreat from eclectivity and without an aesthetic complement in his synthesis, he has displaced the functionary, leaving the automatic power of the internal energy of his organic mechanism in the driving seat. The pattern of his behaviour may be consistent, but it is the consistency of the power of dying – not of *living*.

In less extreme cases it is often difficult to distinguish the spontaneous action in Will from the automatic use of Memory, as for example, in the case of 'habit'. Or, when for instance someone says: 'Let us *first* look at the facts' – i.e. what we already 'know', he is saying 'Do not make a "choice", take a "chance".' Facts pertain to the world of quantitation, and that is a realm of pure chance. You may seem to make a choice when you weigh facts, but if you *only* use facts you are already paraesthetic, i.e. you have 'determined' to take an 'objective' view – which is to ignore, to discount, aesthesia in your present situation. Hence in the action which follows, the *orientation* in which bionomic order

and creativity inheres is foregone. If the aesthetic faculties are undeveloped you may of course be inescapably 'lame'.

In the absence of aesthesia the factual can simulate and be substituted for the actual. Contemporary society is in great danger from lack of appreciation of this fact. Let it ask for bread, and it will be given a kinematic stone. The stone will be 'seen' in form and colour as bread, and soon will even have the true smell and maybe even the taste of bread. Every sense and sensation will be satisfied. Indeed, the day will shortly come when, sitting in our viewing chair, we shall be able to have all the sensations of having had a factual Christmas turkey with all its trimmings and savours – simply by touching the switch of the tele-ambit set. How our *actual* feelings, our aesthesia, will re-act to this experience is not merely not known: it is ignored.

In science and in all contemporary educational technique there is an evident striving to make sensation self-interpretive. But in the sanity of functional action the senses and the feelings are mutually mutating parts, like the two sights which yield 'vision', from which alone meaning emerges – for *me*. Without the aesthetic complement interpretation of sensation is invalid – for living.

It is the faculties primarily associated with aesthesia which are the means of 'specifying' the unique requirements that alone can fulfil in detail *our own* unique *needs* from among the general supply. Specific eclectivity in Will underlies the aesthetic faculty for eclection; and when it is engaged we choose that which meets our own need – along with the needs of the whole of which we are but a part.

So from the aesthetic faculties we derive gnomic knowledge of our needs: it is that knowledge which tells us which direction to move in. It is by subsequent intervention of the external faculties that our sensory mechanism accurately perfects the materialisation that *ensues*. There is little to be gained by perfecting activities which are not in the pattern of bionomic order. They are bound to be ephemeral: if not to lead to chaos.

My feelings, then, are something apart from my senses: they demand consideration. The leg which I have lost (by amputation or injury) is still a 'feeling' leg I have. Though it appears to

be of the ghostly paraphysical stuff that dreams are made of, its ghostly substance is here and now. It is in Memory-Will – without which I cannot 'live'. This ghost, then, is intensely 'practical': it is not of another world. It is in no place from which I have '*come*' into the practical world. It comes with me.

XX

# Willing and Un-willing

As we exist in the vastness of Space swept along in perpetual motion in Time, so we live in the eternity of Memory, 'birthing' in the quickness of Will. In Memory-Will, with all its teeming configurations of phylogeny, its ever-anewing patterns of ontogeny and its futural potential of growth, every organic entity has its locus, its *presence* in Memory-Will; as it has its locus in the *present* of Space-Time. Perhaps one of the greatest difficulties is to grasp that we live in and by this presence. Our persons are positioned in its immensity as our bodies are situated each in its own place in Space.

It must be appreciated that our own memorial content is not drawn from any 'past'; nor are its configurations transcendental factors. Though they may, or may not be overtly evident as Space-Time materialisations, they are here and now, *in the world*: and we live in and by them as we exist in and by the entities that constitute the content of Space.

The entity has a constitution in Memory-Will as in Space-Time, which permits of both automatic and autonomous action. In materio-dynamic operations it is autonomy which renders mechanism manipulable, i.e. serviceable. So, in functional action it is autonomy in Memory-Will that gives to the organism its peculiar attribute of creative individuality – depending upon its use of the memorial content. But functional action, in which autonomy plays so essential a part, can be carried on either to a greater or a lesser degree by man in his locus in Memory-Will. As we have seen, autonomous action within his inhabitation is by no means the mode of action necessarily to be found in what is commonly called the 'normal'.

Though in what the physiologist calls 'autonomic' action, function is continuous at the cell/body and/or the organ/body level, in other scales of action it is not by any means a continuous process in the individual. The cell, the organ, the body, or the organism-in-its-inhabitation weaves its action-pattern in Memory-Will according to the present scope of its action in its memorial locus; whether lesser or greater. Hence, for observational purposes *working contact must be made at the actional zone of mutuality* whatever that be; whether merely at the level of cell-body, of organ-body or at all levels simultaneously. At the outset, then, it is only prudent to make careful selection of material for study. We choose man for preliminary observation because he, as a species, exhibits the most advanced degree of facultisation. It is in man, therefore, that we are most likely to recognise the attributes of action in Memory-Will and be in a position to study their association with Space-Time factors. Man is as a cut diamond, presenting not one but many facets reflecting and refracting the attributes of quality. But it must be remembered that because man is less tropistic than any other species, he is able to control his actions – within a measure. Hence his action will not be consistently uniform; nor statistically interpretable.

With these considerations in mind, we can attempt further analysis of action in the light of Memory-Will.

## Focus: Attention

It is no more possible to escape inherence in Memory-Will than it is possible to escape existence in Space-Time. But once facultised, with man at least and in the field that he calls that of his 'conscious' action, it is within the scope of his own control to ignore or otherwise forego the positive affect of Will in his present action. So in man's use of Memory-Will, alternative processes are open to him for the achievement of events.

Acceptive of eclective motility, he may act aesthetically, in mutuality of synthesis in Memory-Will; or, rejecting and ignoring eclectivity, he may determinately proceed to objective synthesis by his own selective use of the content of Memory irrespective of the dynamics of Will.

## Primary Focus

Let us first examine the latter case in which man in his considered action uses the content of Memory without respect of Will and hence without the present effect of aesthesia. This situation is prevalent and easily recognisable. In this mode, he sets out by recollecting some item or items in Memory for the purpose of making a further synthesis. Using his remembered items as an 'image', he then proceeds to look over the field of Memory, picking out from it that which 'matches' – is similar to – the image he has already selected. In so doing, he uses this image as a '*focus*' to pin-point in the content of Memory that which will 'equate' with the remembrance he has selected. In this process he is 'preselecting' the constituents for his synthesis; i.e. using items in the content of Memory automatically. All that he can draw from its vast resources by this procedure are those things, situations and events in Memory which are of the same specific identity as those he already 'knows'. With these duplicates he makes his synthesis. The process is thus essentially a multiplicative, or proliferative one: its result, a repetition of the same, or a multiple, or permutation of the same.

Through this pre-determinative use of focus, he has 'earthed' his eclectic leads and by-passed Will. In doing so, he has set the stage for synthesis in a unipolar field the centre of which is himself. He has ignored the affect of the total situation bearing upon him; ignored the present impact of aesthesia, and excluded the possibility of the spontaneous mutual apposition of diverse specificities in his locus in Memory-Will. Hence no qualitative diversification emerges in the synthesis he achieves: novelty and creativity elude him.

What in effect has he done? He has used his faculty for recollection divorced from use of his faculty for eclection and so has 'particulated' his total situation: his wholeness. He has then used the particulate recollections as 'static', automatically manipulable 'pieces' drawn from the intricate texture of Memory. In what he calls his 'voluntary' action, he has, in fact, foregone his freedom of 'willing', so reducing the possibility of autonomous action in his total situation to lower levels of function.

In thus using his power of focus to pre-determine events, he has missed aesthetic enjoyment; missed the satisfaction of meeting his needs from the boundless diversity of Memory; cut himself off from the creativity of Will. By so lifting a selected recollection from its context in the locus in Memory, his predetermination has landed him unwittingly in the exercise of senescent growth alone. He has foregone his birthright to juvenescent growth.

It is of great importance to be able to recognise and to distinguish this means of initiating synthesis. In this text we shall refer to it as the method of '*primary* focus' – the method employed in all forms of objective synthesis.

## Attention

The other mode of action open to the individual, is to range over the full diverse content of Memory with all its fruitful possibilities. Acceptive of mutually mutative eclectivity in Will, he 'finds' – 'chooses' – not that which is *similar* to some pre-selected item that can be remembered, but that which is specifically diverse and presently apposite to him for mating in mutuality of synthesis. In this process the subject – *willing* – is making use of eclectivity in Will as an indicator as to *what to focus on.*

To be 'willing' is to be acceptive of the affect of the whole or total situation in Memory-Will and in Space-Time as it impinges on *me* at the growing point at which my own facultisation is proceeding. We do not know what 'consciousness' is, it may well be the organism's awareness of action at its own growing point, or 'coleoptile', whence facultisation is going forward; and whence the initiation of further facultisation comes. Were this so, consciousness would be an attribute of the totality of the inhabitation common to all organisms in greater or lesser degree. It would differ radically from that of a consciousness of 'self', to which the term 'consciousness' is frequently attributed.

A first realisation of the profound difference between primary focus and attention arose during the war when watching a renowned scout. From his deep experience he tried to convey this difference to his pupils. He insisted that 'cocking an ear' –

*listening* – was an incorrect and fruitless method of 'hearing'; that in fact 'focus' defeats the power of hearing everything that is happening and so of knowing about everything – particularly the unexpected. If, on the other hand, anticipation of events (i.e. fixing in mind re-membered patterns pre-selected from the content of Memory) were not 'closing the ear' and so preventing it from hearing, then in the total situation (with the full diversity of its memorial content) that which was of significance *now*, arose into clearly defined prominence (through motility in Will). Where the approach is through attention, not one faculty but *all* the faculties have full play. This difference of approach was appreciable – though not, of course, understood – by the common soldier, who would 'go over the top' with the born scout or the intrepid officer because he 'felt safe' with someone whom 'nothing escaped'.

Attention appears to involve a sort of 'zero-ation' of each sense, so that the seeing, hearing, touching, extend throughout the whole range of sensibility open to sensation, rather than being limited to the relatively minute portion of the field that can be covered by a fine point of focus. Possibly, the ability to act in the mode of attention depends upon the degree of digestion of previous experience. Where digestion of a previous synthesis has been incomplete, the individual is, in fact, still engaged in, still focused on though not 'consciously' aware of the attempt to deal with the undigested material.

Whenever, whether consciously or unconsciously, we project any particular image that persists in our own recollection and use that as a 'focus', the only 'choosing' is between our own projected image and what there is like it. If, when proceeding by 'focus', we happen upon anything unlike our remembrances, our vision is blurred and so any selection we do make can only be an indiscriminate one; for instance, as between white and black, instead of from among the extensive variety of shades that lie between them. And the oftener we go out to select, the less easy it is even to 'match'; for the environment wears new fabrics – in spite of us! As a method of procedure, then, focus when used for *making a 'choice' as to what action to take*, is both limiting and unreliable.

In fact this process of primary focus is not a 'choosing' at all;

it is a reflex due to the *automatic use of the content of Memory* by the supposed 'chooser'. It may be a process that, for him, has the appearance of being the only possible method of procedure. This is more than likely, for it is a process in such common use by civilised man that it is generally accepted as *the* natural one proper to all 'conscious 'achievement. Its general acceptance as the normal method of synthesis, in turn may well be reflected in the anticipation of a purely materio-dynamic interpretation of the process of living.

If on the other hand, our 'attention' is embracing the infinity of Memory, the possibility – not of 'matching' – but of 'mating' apposite specific diversities, is infinite. By moving freely in the mode of attention undominated by our remembrances and so without fore-ordained focus, the whole content of recollectable Memory is available for synthesis by co-eclection in the full richness of the total diversity of the individual's locus in Memory-Will. Through 'willing', the way is opened to finding that out of which will arise new specific diversity pertinent to the total situation in the *now* – for *that* individual.

So while what might be called the 'un-willing' process of primary focus may be highly productive in the materio-dynamic field, it is important to recognise that it can but repeat itself; or be cumulatively repetitive. On the other hand, the 'willing' process of 'attention' is essentially creative; presently 'fertile': vivifying.

## The Place of 'Focus'

Focus, used as a method of '*choosing*' *what to act upon*, excludes action in the mode of attention. But before going further, it is necessary to say that the foregoing analysis of the process of focus in relation to synthesis, does not mean that focus has no place whatsoever in functional action. On the contrary, the importance of focus is critcal. But its place is post hoc; not that of the propter hoc *initiation* of action.

Where functional action arises with motility in Memory-Will, 'focus' follows, making the *operation of the materio-dynamic machinery* highly critical and precise in materialisation of the 'choice' that has been made. It is after the choice has been made that

'digestion' begins. Focus as a *post hoc* procedure initiates the analytical process in which *all* the appropriate external faculties are brought into discretionate use.

Hence, focus is the functional means of fulfilling and of perfecting the materialisation of action that has been initiated through the realisation of new patterns of specificity co-eclected in Memory-Will.

Realisation in Memory-Will is not the same as materialisation in Space-Time, however closely they may ultimately prove to be co-ordinated in functional action. There is a difference of dimensional dynamic between them. Attention engendering realisation in Memory-Will waits upon eclective motility to fulfil the specific needs of that particular individual in his present situation. Realisation is essentially to be associated with the emurgetic dynamic in Will acting autonomously through the autonomous individuality. Focus, on the other hand, is dependant upon evolution of the individual's own internal energy resources and these may even operate purely automatically.

Entirely unorthodox as this proposition may seem, it should not surprise us. It has important significance. We have seen that the visual stereograph is not due to the direct result of light waves on the eye. The synthesis that ensues in the individual involves some other factor, the nature of which hitherto has remained undisclosed – though it is that synthesis which yields meaning for *that* individual. Organismal sensibility appreciative of new patterns in Memory-Will is invoked by some 'energy' process other than that manifested as energy in Space-Time. Moreover it is awakened only where the action is proceeding autonomously in the organism.

The qualitative 'stereographic' association of energy factors – from the parts and from the whole; within-out and without-in – is the basic dynamic mode of action of organism functioning in both its locus in Space-Time and in its locus in Memory-Will. But we have found this to be the as yet unexplained requirement in all facultisation wherever seen.[1] In function action is never unitary. It is essentially trinary – from the two parts *and* from the whole. The principle is the same whatever be the scale in which it finds expression – even in our own actions. This trinary

[1] Chapter IX.

constitution of all functional action is, however, one of quality; not of quantity.

## Categories of Synthesis

There are two ways of doing everything. To 'look' takes time; to 'find' is a spontaneity in Will; it may take much or little time. The difference between them is one of dimensional dynamic. Either by the use of *primary* focus, man, not orientated by motility in Memory-Will, can automatically 'mentipulate' the content of Memory as though that content were 'static': i.e. consisted of inert or static 'pieces' available as such for use in any form of objective synthesis. Or, in the mode of attention, acting eclectively in Memory-Will, he can autonomously take orientational directive from the whole. In so doing he participates in mutual subjective synthesis – of himself and his inhabitation – with its attendant creativity and juvenescent growth.

It now appears that the basic distinction between the two types of synthesis which we discussed early in this text lies in the utilisation of the content of Memory made by the organism. It will thus here be convenient to summarise each process with due regard to its relationships in Memory-Will.

*Subjective* synthesis is initiated by the individual's attitude of attention wherein eclectivity in Will, inducing mutuality of synthesis in organism and environment, has full play to realise new 'origins' – new patterns in Memory-Will. From this novelty of specific pattern the individual derives aesthetic imperience. Henceforth the synthesis is materialised according to the precision of his faculties. Now the power of *secondary* focus brings the critical accuracy of the faculties into full play, so leading to highly discriminative action. It is the autonomous constitution of the organism in its inhabitation which gives scope for the process of subjective mutual synthesis both in the ethonological body of the individuality and in his organic mechanism.

In contrast, objective specific synthesis, initiated by the use of primary focus, draws only from the range of those specific patterns in Memory which are within the organism's power of matching with his own remembrances. In by-passing eclectivity in Will, the input of aesthetic imperience, along with its

accompanying feeling of ease, is foregone. The quality of action, being automatic rather than autonomous in Memory-Will, escapes the fertilisation arising in a bipolar field of unity of organism and environment. This is equally the case whether the action is what is commonly called 'voluntary', or merely habituated.

We earlier introduced 'thought' in referring to man's use of the content of Memory. Since we now find two distinct processes either of which may be involved in materialisation of action, one creative, the other multiplicatory and repetitive, it follows that there must be two kinds of 'thinkers': 'intuitive' thinkers; and 'reasoned' thinkers. Intuition tells us 'what to think about'; reason, how to think in a modern way. Intuitive thinkers are those to whom thoughts 'come'. They arrive: are 'found' through mutual synthesis in the eclectivity of Will. But the thinker in this mode may have little power of facultisation, little power of 'focus' to bring his thoughts into discriminate operation. In that case, the 'reality' of his thinking makes no mark in materialisation in the Space-Time medium. There are also intuitive thinkers who, acting eclectively, 'know what to think about' and at the same time are sufficiently facultised to bring the reality of their thoughts to discriminate materialisation through subsequent focus. Here, to intuition, reason is added. All the messiahs were of this latter kind. Their very recognition as messiahs, hangs upon the fact that their thinking brought a new order of action within sight of mankind. There are, of course, among those commonly classed as thinkers, those who 'also ran' – those who, un-willing, rely *only* on reason. Their action though materially highly productive will fall short of creativity and of order, both in their own and in the total situation.

So, for example, an intellect busied with objective synthesis deriving from its own remembrances – re-collections in Memory – can perform the most complicated operations with consummate skill; can assemble endless constructs out of patterns in Memory that are within its power of remembrance. It is only necessary to envisage the infinite and ineffaceable content of Memory and to couple that with the prolific possibilities of

man's power of 'remembering', to appreciate the extent of the combinations and permutations available for the process of objective synthesis. Nevertheless such objective syntheses are ephemeral; not co-eclected in the content of Memory they leave no residue. However voluminous their content, from such operations progressive qualification is withdrawn. The constructs so made are, in fact, like crossword puzzles – highly skilled, highly intricate, but without meaning for living – though they may represent compensatory action for the lack of ease in *not* living. Man, perhaps in this alone among the species, has the distinction of being able to sell his quality for a mess of intellectuality. He alone has the power to use Memory – *automatically* – as he alone can manipulate the content of Space.

But the different possibilities of procedure can be seen in the methods of approach to the most familiar undertakings. The subject of immunity affords an example of the contrast between the two methods – the co-eclective and the re-collective use of Memory. In immunisation against diphtheria a selected object to be 'remembered' – the toxin of diphtheria – is injected (along with anti-toxin) with the purpose of inducing its subsequent recollectability in the body of the patient. The result so obtained might be distinguished as *re-collective* immunity. There is also a *co-eclective* immunity arising in Memory-Will. In this case, the individual is inherently 'immune'; or more correctly, *insusceptible* to diphtheria. There is no evidence in any infectious epidemic that all who do not succumb to infection, do so in virtue of a 're-collective' immunity derived from previous infection. Immune bodies (induced by previous infection) can by no means always be found in all those manifesting insusceptibility. Between the 'immune' and the 'insusceptible' there is a difference in the body's action-pattern. We do not, however, yet know on what this attribute of insusceptibility rests. It is a matter which calls for both exploration and explanation.[1]

Fear is another factor which reduces the scale in which an individual lives in Will. He, fearing the new and novel, fearing change, or wanting to hold fast to what he has, may reject the eclectic dynamic that points to – orientates him – in the direction of that which he does not court. Directives arising in

[1] Appendix 4.

Memory-Will may run counter to the course he has already determined upon; or may appear to entail a degree of facultisation which he has not attained and does not 'believe' he can attain. So, blinding himself to his needs, he does not *want* to accept action in the terms of the direction his inherence in Memory-Will foreshadows.

Though not stated in these terms, this situation is well-known to the pathologist and the clinician called in to allay its symptoms – conflicts, repressions, neuroses, psychosomatic states; if not fully expressed organic disorders. The basis of many of the above pathological states lies in *negation of eclectivity in Will.* Hence, there is attached to them *lack of satisfaction*: the antithesis of ease, arising with aesthesia. In the individual the subjective result is one of negation – '*discouragement*'. Man can do 'willingly'; or 'unwillingly'. But cutting himself out of his own fertility by 'unwillingness', he acquires a 'feeling' of his own inadequacy: he lacks courage.

Waste of Will drains the well of life dry of *courage* to act.

So, as we look at the nature of man's action in Memory-Will, not only can we appreciate the riches that Memory holds for him, but dimly can begin to envisage the potency of Will in his behaviour. We have seen that *not* to act in Will, to retreat from its implications, may lead to pathological states in the individual. But there is yet another possibility to be explored – the deliberate ignoring of Will.

When Will is ignored – when we have 'no time' for eclectivity – no 'love' within us – there arises a 'vacuum' due to the evacuation of Will. As the 'negative pressure' of this vacuum increases, a powerful suction is set up equal to the eclectic potential capable of fulfilling the functional needs of the individual. As his intrinsic 'needs' progressively fail to be fulfilled, order in the individual's action is replaced by a chaos of indiscriminate *wants* pressing upon the vessel from every side.[1] Without involvement of the aesthetic directive in action, the individuality is functionally disorientated so that order evaporates from the action that ensues. For, while willingness is spontaneous within the whole, unwillingness is *de*-liberate – i.e. the free

[1] Appendix 34.

wheels of autonomy liberated *from* their whole, become 'loose' wheels.

When this situation arises, the organic mechanism does not stay its operation. Losing autonomous direction, its response now becomes automatic; without discrimination. Then, in direct relation to the mounting pressure of wants and their fulfilment, satiety follows. 'Love' turns to 'lust'.

The negative power of Will that has induced promiscuous wants, is the *same* power which, acting positively, both creates and fulfils needs; specifically – qualitatively. We love; or we must lust.

There are, then, two different modes in which the individual may attempt to evade action in Will. He, aware of Will yet incompetent to comply with its dynamic impact, may be in retreat; or, ignoring Will, he may fall prey to the negative pressure of Will – where wants replace functional needs. Each mode will be accompanied by its appropriate action-pattern. Whichever path he takes he cannot contract out of the power of Will.

## Voluntation

The absence of words for new differentiations of thought makes communication dubious. 'Willing', i.e. orientation by eclectivity in Will, must be clearly differentiated from the 'volition' of the philosopher; and from the term 'voluntary' as applied to action by the physiologist. 'Willing', i.e. action in Will, can be 'voluntary', or 'involuntary'. It is, however, in but the smallest fraction of his living processes that 'willing' – eclectivity in Will – rises into the consciousness of man and so becomes 'voluntary'. Each evolutionary discrimination, or each exuberant specialism, derives from the organism's locus in Memory-Will from which mutual synthesis proceeds. This locus might be called a 'domestic' locus; or more aptly, a 'placental site'. Though pre-eminently engaged in mutuality of synthesis, i.e. 'willing', the placental function (as exemplified in the maternal placenta) is notably excluded from any 'volitional' attributes that we commonly associate with facultisation. So 'willing', or – we have no word for it – *voluntation* of eclectivity in Will,

covers a vast field of action bearing no relation to 'volition' as commonly understood.

It is important not to confuse what man calls his 'volition' with voluntation in Will. Volition, the notion of having made a choice, can be – and usually is – associated with the determinative mode of primary focus as defined above. Thus, in common use 'volition' is clearly 'predeterminative' – which seems, and is, a negative procedure. The determinate mode of primary focus is associated with the individual's retreat from mutuality of synthesis in which the voluntation of Will is engaged: he is *un-willing*. Thus 'volition', commonly used with reference to the making of a determinative choice, is the antithesis of voluntation in Will.

In contrast, where volition arises in functional action, it does so as the post hoc record of a niceness, exquisiteness and precision in the spontaneous process of eclection. But in this case volition is really 'historical' – the feeling of satisfaction following a functional achievement.

Though possible, it is rare for action in the mode of attention followed by focus, to be so 'unified', so co-ordinated in the dimensions of Memory-Will and Space-Time that the subject consciously 'wills' to be 'willing'; 'wills' to 'voluntate' in Will. Rarely does he 'voluntarily', as it is commonly called, accept his opportunity to act eclectively.

It is awareness of such a possibility that often characterises the mystic. Many systems, religions, mystical and philosophical, directed to the cultivation of such unification of action in all its different scales, have arisen down the ages. But in the main, so far do they diverge from the common standards informing 'volition', that their aim remains largely beyond the understanding of 'normal' man following the goals of western civilisation.

We then – autonomous 'individualities' in Memory-Will and autonomous mechanisms in Space-Time – may live in the unity of functional action in both dimensions; or, foregoing autonomy in Memory-Will, we may operate the content of Memory automatically, as 'static' items without reference to eclectivity in Will. Man alone appears to have this choice.[1]

[1] Appendix 35.

There is, of course, the common idea that you can 'do nothing'; but in fact all existence must either be positive or negative. Whether we like it or not, we cannot escape Will, cannot 'choose' to do 'nothing' – any more than we can choose to do everything. The attempt to do either of these impossibilities represents known states in mental pathology.

This raises the question of what is commonly called man's power of '*determination*' – often referred to as 'my will'. In the context of Memory-Will, determination is an attribute of the individual who, ignoring the affect of eclectivity in Memory-Will – and hence devoid of present aesthetic imperience – himself selects the direction in which to proceed. In so doing, he by-passes the possibility of aligning his action in bionomic order.

But like focus, determination has its place in functional action. As with focus, that place is post hoc to the *initiation* of action. It lies in concentration on the discriminative processes of facultisation in the materialisation of events in Space-Time – but not in what to use that facultisation for.

XXI

# The Functionary

## I. THE 'DIRECTOR' OF FUNCTIONAL ACTION

There remains for further consideration the question that assails both scientist and philosopher: 'what' or 'who', is 'director' of organismal action? Experience has consistently led man intuitively to feel that he can choose his direction; but physical science gives no assurance whatsoever that there is any choice: that there is, in fact, anything more than the operation of *mechanism* to explain the circumstances of living.

The study of health throws doubt on the simplicity of that explanation. That man is not always 'himself', a fact objectively observable as well as subjectively appreciable, would seem to indicate that there are different modes of using the organic mechanism. Hence our own studies early led to a careful sorting of human material into categories: man in disease; man as a surviving entity, i.e. in compensative existence; and man in health.[1] Only in the last category is the full expression of the functional action of the organism observable.

It cannot be too often emphasised that man as a 'machine' does not call for any such sorting of material. Were quantitative estimations of the organic mechanism alone adequate for understanding functional action, or health, the physicist's terms of reference would suffice to cover the full range of function in organism. But in that case, *health* would have no distinctive meaning.

The difference must be recognised between system that under-

[1] *Biologists in Search of Material.*

lies materio-dynamic sequences of the operation of mechanism, and the phenomenon of order manifest in the functioning organism. Early in this text, we introduced the term 'functionary' to designate some factor as yet unknown which appears to induce order in the living process of organism. The functionary, we said 'gives something to the action which does not pertain to the sequences of the organic machine. It gives it a pattern of order.'[1] There the matter had to be left without further clarification. It is to this question that we now return.

In studying functional action we have come face to face with the issue of quality. The consequent search for the realities of quality has immeasurably widened the field of exploration, making it possible to conceive of organismal action as arising not only in the organism's locus in Space-Time but also in its locus in Memory-Will. So, in dealing with the question of what may direct the action of organism, we are no longer limited to the acknowledged range of physical science.

Looking at organism in its locus in Memory-Will, we have seen motility in Will orientating the specific configurations of the memorial content of the organism and the memorial configurations of its context, or inhabitation. Here there is a basis for a directive relevant to qualitative change of pattern.

This orientation, moreover, is one which arises in respect of the specific functional needs of a specific organism located in its specific inhabitation. But those are no other than the particular circumstances peculiar to organism, which make the presence of order conspicuous in the organic world. So then, it would appear that the induction of order derives from the locus of organism in Memory-Will, where *mutuality* in synthesis is induced.

Order is an attribute of quality. The orientating directive from which order ensues affects what the organism will operate on, though it in no way nullifies the regularities by which the quantitative materialisation of organismal action is effected in its locus in Space-Time.

Now since the constructional principle of the organic mechanism has the attribute of directibility,[2] so there already exists in the

[1] Chapter III, p. 32. [2] Chapter XII.

mechanism the potentiality for response to such a directive in the dimension Memory-Will.

In any consideration of possible direction of a directible organism, the notion of organism as an autonomous whole must be steadfastly sustained. This applies both to the autonomous organic mechanism as an operational entity, and also to the autonomous organism as a qualitative ethonological whole. So for order to be manifest, the organism must be seen and in experiment manipulated in its inhabitation both in its locus in Memory-Will and in its locus in Space-Time. Let us then pursue our search for the functionary by looking at the two forces or factors which are involved in the action of the autonomous organic mechanism in functional action.

Functional action in its highest scale in the body of the organism we have seen to arise in a bipolar field of unity, the poles of which are from without/in and from within/out: sensation/aesthesia. Just as sensation, appreciable through the sensibility of organism, induces change in the organic mechanism, so aesthesia, equally appreciable by the sensibility of the organism, in turn equally induces change in the aesthetico-directive system of the organic mechanism. The actional manifest of the poles is to be found on the one hand in the *in*come deriving from sensation at the external environmental threshold, and on the other hand from the *out*flow of aesthesia, emanating from the internal environmental threshold. It is in the actional association of these two factors that the directive becomes manifest in the organic mechanism, issuing in an order sustaining the organism in its uniqueness. Order, thus originating in Memory-Will, is seen and finds expression in Space-Time.

It is recognised in science that sensation is an attribute cosmic in scope – common to all. The source from which sensation is derived is thus independent of the organism; its origin is from without, contextual. The income of sensation accrues to the organism through organs or parts of its organic mechanism – which can operate in the mechanism a-part from the organic whole. But no order is to be seen in the study of the isolated sequence of effects of sensation on the organic mechanism. Order does not, cannot, arise from the effect of sensation alone in the operation of the organic mechanism. So the directive does

not lie there. We cannot equate our functionary with sensation.

Aesthesia, manifest of the other pole of the field of unity of organismal action, is in a different category. It arises spontaneously from eclectivity in the organismal locus in Memory-Will, from which source, through the sensibility of the organism, a store of aesthetic content accrues in the organic mechanism. In functional action, from this store a complement coming from within – contentual – is expendable by the organic mechanism according to the functional needs of that organism in its inhabitation.

Aesthesia, though determining what the organic mechanism will utilise in functional action, is no more than the *means*, though an indispensable one, whereby the directive is primarily linked with the organismal mechanism. Neither then, is aesthesia the functionary for which we are seeking.

In answer to the question: 'What is the functionary?' it is to the qualitative memorial body itself that we must turn – the ethonological body subject to motility in Will amidst the specific configurations of cosmic Memory. This answer was denied us before, for the inhabitation of this ethonological body – the functionary – is in the dimension in which quality alone is significant; Memory-Will.

The organism as mechanism can and does continue in sequential operation with or without the present direction of any factor represented by the functionary. It is in the 'presence' of the functionary, the memorial ethonological body in its locus, Memory-Will, that the reality of the directive lies; just as the factuality of the organic mechanism lies in its 'present' in Space-Time. It is on this qualitative presence that the direction of the directible organic mechanism hangs: *this prescence that guides the sensibility of organism.* The functionary 'sits', as it were, on the mobile fulcrum, third agent in the trinary balance equilibrating content/context in functional action.[1] The manifest of movement of that fulcrum is aesthesia; the affect of its movement is choice – in the direction in which to utilise the chances available for action. This presence of organism in Memory-Will prescribes how *will* be done what *can* be done by the organic mechanism. It is this presence that constitutes the

[1] Chapter x, p. 118.

director of the directable organic mechanism – the 'chooser' of chance. That is the factor for which we have been using the symbol 'functionary'.

So, whereas in terms of events as appreciable in the Space-Time dimension a deep inevitability seems to face us at every step, in functional action this inevitability recedes – because of the spontaneity of the functionary in Memory-Will. The living organism is a qualitative whole sustaining its uniqueness eclectively through its locus in the qualitative medium Memory-Will. But in these terms, organism is more than the sum of its parts: nor does it exist merely in the sequences of operation of those parts – as accountable in terms of Space-Time. Its presence in Memory-Will immeasurably enlarges the vista and the potentialities of the organism, releasing the organic mechanism from the thraldom of inevitability: i.e. purely from the dictates of chance.

It is only, however, in the zone of mutuality between organism and environment in functional action that the comprehensiveness of autonomous organismal action can embrace the totality of the diversity available in Memory, so gaining a degree of freedom which permits of choice amidst that diversity. Hence, only functional action-patterns are beyond prediction.

In general terms it can be stated that in the organism in vivo the spontaneity of action deriving from Memory-Will presides over the direction in which to move into the future, while the sequential processes of the organic mechanism as observable in the Space-Time dimension preside over the materialisation of action as it presently ensues. Thus, briefly, it might be said that the quantity of existence is ordered by the quality of living.

## 2. IS THERE A WORD IN COMMON USE FOR THE FUNCTIONARY?

So different is the overall view of functional action of organism as seen through the bioscope, that it is perhaps desirable at this stage to make a brief but critical examination of some of the factors commonly assumed in some way (not wholly defined) to be responsible for a choice. The existence of personality, or equally of individuality, or of mind, is frequently raised in sup-

port of the presence in organism of some form of choice, or direction of action. So far, however, there is no commonly accepted definition of these entities: nor indeed any clear understanding as to whether they are the same, or in what way distinct. Could any of these find their place in relation to our functionary?

## Personality

We can see, touch and factually appreciate the materiality of organism: what is its essential material basis? It has a specific genetic inheritance giving it a specific genetic *content*. This content does not determine its individual fate absolutely. That content, however, does set a limit to the possible forms of materialisation to come. Limited, then, to certain possibilities, but strongly biased towards the development of definable specific traits, this content is unique and distinct from that of all other organic forms – a highly personal attribute.

The *context* of the organism, as seen in nature, is a qualitative field of possibilities, also specifically patterned in relation to that particular organism. We have called this field, in which the living entity is conceived, and in which it may – or may not – proceed to unfold in its progressive facultisation, its 'specific nurtural inheritance'.[1] Thus the initial context also is specific and personal to that organism.

It is these two factors together – the specific genetic content and the specific nurtural context – to which we would attribute 'personality'. 'Personality' would thus represent the raw, but specifically qualified, material basis from which action proceeds in any given organism.[2]

'Personality', so defined, represents the indigeneity of the organism embodied in the raw material of the 'person'. It is, then, in no way synonymous with the functionary.

It would seem that we have no control over our personality as here defined; and moreover that the 'what' of our personality sets a limit to what we may become in terms of Space-Time. Nonetheless, the degree of any such limitation is not exempt from close scrutiny. As modern experimental methods are tending to disclose, man is becoming increasingly able to modify

[1] Chapter x, p. 137. [2] Appendix 36.

the attributes of the personality of organism. Experimentally he can, in a measure, determine the gene content with which a living entity will be endowed. Equally, he can manipulate the specific nurtural inheritance deriving from the ecological positioning of that entity in natural circumstances. In the case of many of the lower species, he can remove a sample from its natural nurtural context or, in the case of mammals, change the nurtural context from the moment of implantation of the fertilised ovum in the womb. What the long-term effects of such procedures may be for himself and for other species on which he can so operate is not yet foreseeable. That is not our concern. It is, however, possible that recognition of the inherence of organism in Memory-Will as well as in Space-Time may allow of some future clarification of that issue. It must be admitted that though indigeneity plays little or no part in the physiological field of chance, it does play a great part in the bionomist's field of choice in which order is implicit.

## Individuality

From the basic endowment of personality, *individuality* grows by progressive facultisation. In the process, both the specific content and specific context become further patterned by qualification in Memory-Will. With no loss of its initial specific attributes – for in the content of Memory they are ineffaceable – new and more intricate specific configurations arise in both content and context of the individual and his environment, embracing as they do so all the specific patterns of that personality that have preceded them and which still pervade them. Personality thus is not 'lost': it remains the morphological basis, material and memorial, of the individuality.

While the individual is growing through the elaboration and differentiation of his faculties (that growth being demonstrable in his action-pattern), every functional action adds, as it were, to the stature as well as to the discriminatory development of his individuality. So in general terms growth presents not merely a quantity picture but outstandingly a *quality picture*. The building up of the inscription of this quality picture in the functional field is de-limited – i.e. 'freed' – by the mutuality of

the synthetic process presided over by the orientational directive in Memory-Will. The functional situation and its possibilities are by no means co-terminous with nor directed by materio-dynamic systemisation; though the two as we have seen, have to be co-ordinated.

But the above circumstances to be seen in the organism do not represent the whole 'quality picture'. With each step in the process of the individualising of content and context of the personality, the heterogeneity of the general environment becomes progressively homologised by the entity – through its growing points, the apposite specific facets which it presents to the general environmental context. So the specifity of the context originally congenially specific to the individual is extending; and along with the growing process there arise newer and newer fields of quality which, owing to the mutuality of synthesis from which these arise, pertain to the specificity of the entity and to its inhabitation alike.

These fields of quality of organism and environment bite their uniqueness into materialisations in which the action of organism and inhabitation are functionally involved. In this process 'individuality' emerges – represented by the progressively discriminative facultisation of the initial personality.

Though rising from facultisation, the discriminative attributes of which are associated with orientation in the organismal locus in Memory-Will, individuality is no more to be confused with the functionary than is 'personality'. Individuality does, however, yield action-patterns which are a manifest of the directive potency of the functionary, since in the case of functional action its growth depends on progressive qualification in Memory-Will.[1]

Individuality will have its own distinctive action-patterns, these pervading both content and context of that individual. They have to be distinguished from those of the unfacultised personality. The reaction of disease often underlines this distinction in the individual, for it induces reversion to the undifferentiated patterns of the naked personality. So action-patterns have to be scrutinised with some care.

The picture of individuality is a difficult one to hold in mind.

[1] Appendix 37.

Quantitatively immeasurable, an individuality may be related to but is not comparable with other entities. Indeed it might seem that by its very nature it must be antithetic to all others. Any collection of such individualities, all of them antithetic, would seem inevitably to lead to chaos. What, then, redeems the situation?

Individuality is an attribute of quality; not of quantity. Redemption lies in the realm of quality, where there are as many wholes as there are living entities. There each whole is related to every other whole through a greater whole in which all share, as each cell is related to every other cell through the body of its inhabitation. So each individuality, member of a family, is related to every other member, and each family again related to every other family in its inhabitation through their social whole – properly called *com-(m)unity*. So through an understanding of individuality it comes to appear that community is no mere aggregate of individuals; it is an ethological entity of quality in Memory.

So the action of individuality is not that of antagony to all others. It is one of *protagony* within the whole: that whole being enriched by every enrichment in quality of each of its (contained) individualities. Hence, the richer the individuality, the greater the altruity in the field of its action; so the more all-embracing and congenialised does the inhabitation become in quality.

But here we must beware of confusion introduced into the situation by pathological states. The protagonist within the whole may become antagonist – its pathological counterpart. The antagonist – a sore in the body of the aggregate – can never escape notice. In disease he invokes the reaction of disease in the aggregate. Individuality in the protagony of health, on the other hand, is as it were a 'child of the home' at ease in the idiom of his inhabitation; so 'acceptable' as to be 'taken for granted'. Thus, far from being blatent, individuality can even escape notice – as a tuned string in a tuned harp, obvious only when its action is peculiarly pertinent to a symphony.

How are the ethological and pathological expressions of individuality to be recognised? In antagony, the action-pattern is that of one who, as he guides his chariot into the future, is all the time seeking 'objective' proof and measure of such capacity

and capability as he has. He drives 'to prove' as a contestant, seeking a competitive quantitative basis by which to measure a belief in himself. He measures himself as against another – or (statistically) against all others. In search of 'security' and solace, he falls back on the protection of repetition – the expression of the *re*-action of pathology.

But there can only be protection from the 'known'. Both 'protection' and 'security' necessarily forswear the creativity of individuality. The development of individuality implies spontaneous autonomous fertile action within the whole of the inhabitation. He who cannot evince spontaneity has no I-ness.

Individuality, though based upon the specific constitution of the personality, depends upon the degree of the individual's autonomy in action. Autonomy lies in 'environmentality'. For example, in loss of autonomous action within the whole of its inhabitation, a cancer cell originating in the liver loses its 'liverality' (individuality) while retaining its personality; for its 'origin' (personality) is still recognisable even when it has lost its *functional* significance as liver cell. It is on the *mutuality* of action within the whole that health lies. And it is in this actional relation to the whole that the qualitative factor significant in the development of individuality lies.

Individuality merging from progressive qualitative action in Memory-Will results from the directive arising in that dimension. But it is not the 'cause' or 'origin' of that directive. So it is no more the functionary, than is personality. While, however, the personality once laid down, remains whatever the circumstances, the development of individuality hangs wholly upon the functionary: i.e. the organised presence in Memory-Will.

## Mind

We now come to a more difficult subject: mind. There are many definitions of 'mind', as well as different circumstances in which the word is used. That in itself is almost sure proof that no satisfactory working definition has so far emerged. By the layman it is usually assumed that if any choice has to be made, it is

his 'mind' which directs that choice. Science, on the other hand, is reserved on the matter: it gives no clear lead. Only in recent years, as the science of communications is developing and electronic machines appear, is there a suggestion that the emergent phenomena might even be attributed to a 'mind'; mind thus becoming the attribute of mechanism.

Now that we have been able to draw a distinction between the organic mechanism and the organism as an ethonological whole, we are in a more favourable position than formerly to distinguish mind from other entities – such, for example, as soul, psyche, consciousness, thought, intellect, or even the brain – with which mind is loosely equated.

We will begin figuratively. Looking at the organic mechanism with its surface area replete with sense-receptor organs of many kinds, we can picture the organism as a full-rigged ship riding the sea of circumstance, all sails unfurled. Those sails – its many and various sense-receptor organs, are resilient to the power of circumstance ceaselessly playing upon them. Each sail – a 'free' wheel open to autonomous action – is related to every other free wheel. Never directly related as in inter-se relationship, but related to all others in a per-se relationship through the 'chassis' or body of the organic mechanism as a whole. Hence the organism comes to acquire an overall sense of unity, in reference to its place in Space and motion in Time – a 'sense' of *all* that can be done. In brief, it acquires '*mind*'.

Mind, sensory master tool of the organic mechanism, consists of a multitude of parts, the sense-receptors, of which each and every one acts as a free part of a whole – which whole is itself autonomous. Each part is sensible of the whole: the whole is sensible of each part. So the mind is instantaneously and simultaneously in balance in its own field of circumstance – 'at one' with its context. That context can, of course, be extended by development of the resilience and responsiveness of the sense-receptors to the power of circumstance e.g. through education.

It is important to remember that in the *functional action* of the living entity, mind as the overall instrument of sense-reception of the organism, like any lesser organ of sense-reception can only function in a bipolar field of unity of which

sensation-aesthesia are the poles yeilding the stereographic 'vision' – or meaning – for its owner.

Without this aesthetic complement in facultisation – without feeling – the organic mechanism, fully equipped though it be with a fully-developed mind, is no more and no less than a *Marie Celeste*. A valid ship – fully-equipped, fully-rigged, with sails unfurled afloat upon the sea of circumstance – specifically commissioned: but without a helmsman!

So mind is versatile indeed: can lead the organism on any course it wots of. As a sharp and exact tool it is open to subjective synthesis orientated by the functionary through the power of eclectivity in Memory-Will: or to objective synthesis by the organism engaging the content of Memory se-lectively. Mind avails fully and equally for either process.

When the mind is presently 'directed' by the functionary, autonomously i.e. by eclectivity in Memory-Will the spontaneous expression of action will be original and creative. Or, when the organism, operating in primary focus, is using the content of Memory automatically, abstracting items from its own store of recollections, its use of mind will issue in procedure which is merely replicative or proliferative. Bypassing present eclectivity in Will, the resultant action may be productive; but not creative. Or yet again, mind can be relegated to and employed purely in the sequences of the mechanism as in the reiteration of habit. We now know that the physical circumstances, i.e. the capacity for such reiterative procedure, do exist in the brain, for use by mind; in whatever mode of action it may be engaged.

So mind may be used with or without directive by the functionary. Indeed, as we have defined it as in essence of the organic mechanism, it is easy to see that mind could well be directed by 'another' functionary making use of it as a mechanism. It is not difficult to think of examples: hypnotism, automatic writing, use of media, and so on. And it has to be recognised that the use of a mind without present direction by its own functionary might be no less productive – nay, even more so, than when orientated spontaneously by eclectivity, within its own locus in Memory-Will. Declutched from any present orientation by the aesthetic content of its owner, and so released from the specific 'forgettances' of the organism in its own inhabitation, mind may

well be able to move with enhanced versatility – or licence – in the eternality of Memory.

In functional action aesthesia is the link between Memory-Will and the organic mechanism. It is not, as we have seen, the director of that mechanism; it is the hand upon the helm – the *means* by which the functionary or directive is related to mind in the organic body.

Neither is mind the directive or functionary. Superb instrument; it is related to the functionary through aesthesia, born of the presence of the organism in Memory-Will.

Emphatically, nor is mind the instantaneity of thought; it is the 'instant' of action: our means of action within the corpus of space and time. And action can be quite thoughtless and quite feelingless. Mind is a *mechanism*; a materiality like the body. (It may be a little disturbing to human vanity to credit moths and amoeba with minds.)

## Psyche? Soul?

It still has to be considered whether the directive arising in Memory-Will might not be related to some entity with which we have acquaintance through psychology – e.g. the psyche. True, psyche is to be understood as intimately associated with aesthesia – love in all its hues – for that, presumably, is the derivation of the word. But, as we have seen, aesthesia is not the directive: not the functionary. It is, as it were, no more than the 'directing' hand on the steering wheel, i.e. it conveys the direction, but does not 'originate' the directive.

This distinction is an important one in pathology, for the clinician and the psychopathologist are too apt to throw blame on the 'directive' – when in fact the trouble lies either with the hand on the rudder, with defects in the steering mechanism, or even in one or other of the free wheels – the autonomic 'senses' which, having become locked, render the whole an automatic engine-driven unit insusceptible to the directive. Whatever interpretation is given by the various schools of psychology to 'psyche', it may be one step forward towards clarification of the issues involved, to recognise mind as something distinct from, psyche; and both as distinct from the functionary.

Though 'psyche' in its most general sense has to be closely associated with love, the source and origin of which we here attribute to eclectivity in Will, psyche has acquired so many and devious associations that we foresee only further confusion arising from any attempt to make use of the term in this treatise.

Better, perhaps, if we must associate the functionary with any entity previously intuited, to attribute it to what man has from time immemorial called 'soul'. But the 'soul' of which we might thus speak is not the soul or psyche of the psychologist, nor of any other technologist; it is the simpler soul of our forefathers whose major concern was to bring body and soul together – profound picture!

But if it is 'soul' we have been calling the functionary, then soul is a property of all organism. Its inhabitation is in the realm of quality: its 'presence' ineffaceable, in the dimension Memory-Will.

Were we, in another sense, to interpret soul as the age-long expression of man's intuition of being in Memory-Will – then 'soul' might reasonably be equated with the functionary. In that interpretation the artist, poet, mystic, theologian – and the scientist, might well find a future meeting place – i.e. in their location in the dimension Memory-Will.

But however we may name the functionary, it is essential to be clear as to the significance of the directive we are concerned with: for according to our hypothesis, on this factor hangs the question as to how bionomic Order appears in organism.

While the presence of a directive may be accounted for in the dimension Memory-Will, it must be clearly grasped that Memory-Will is not that directive. Like the Space-Time of the physicist, Memory-Will is but a convention, a man-made grid of reference against which phenomena can be seen in their respective relationships. A dimension, Memory-Will, is advanced here purely as a 'convenience' whereby things, situations and events can be seen and understood with greater clarity.

Moreover, neither Memory-Will nor the presence of the functionary in that dimension tell us of the essential 'origin' of Life: any more than the dimension Space-Time of the physicist tells us of the essential source or 'origin' of Energy.

Schroedinger, the physicist, alive to a great and unsolved problem, has asked the question: 'What is Life?' That question cannot be answered; cannot even be asked. But what can – and must – be asked is, '*How* does "life" behave? How does "life" in the process of *living* utilise that which energy can effect?' It was search for an answer to this question that has led to the postulation of a functionary – symbol for the existence of a *directive* of the directable organic mechanism.

XXII

# Memory-Will and Space-Time

We have presented and defined a dimension Memory-Will. This we have done as a convenience to illuminate manifestations of quality which elude detection in any purely quantitative approach to the living organism. But since admittedly the terms of the hypothesis presented are alien to contemporary scientific thought, the question must be asked 'Is there any basis for a possible correlation of such a dimension with that of Space-Time?'

Physical science, concerned with content and dynamicity in Space-Time, has no place for quality and gives no clue whatsoever as to its nature. Nonetheless, since the living organism which manifests qualitative attributes has a material quantitative existence in Space-Time, it would seem that there must be some link between quality and quantity. Let us then – and in the most general terms – look at our dimension Memory-Will with a view to finding any possible means of relating it to the Space-Time of the physicist.

## The Nature of Wholes

Quality we have found to lie in wholes. Furthermore, we have seen that the process of qualification – the mutual subjective synthesis of functional action arising in fields of unity in Memory-Will – in action is associated with the property of wholeness. While, however, the notion of 'whole' is acceptable to the common man and though the importance of wholeness has not escaped the attention of the scientist in various departments of biology, particularly those of psychology and medicine,

yet no such entity as 'whole' finds any place in physical science.

In the biological sciences where wholes do intrude, the fact that organic material can be studied piecemeal and that parts of an organism isolated from their whole can operate autonomically – indeed in some cases even automatically – has for a century or more detracted experimental attention from wholes as entities of significance. It is perhaps due to their having escaped experimental investigation by the scientist, that so far wholes and wholeness have remained without exact definition. Hence, before making any attempt to associate Memory-Will with Space-Time, it behoves us first to ask the question 'What is a whole: and what its properties?'

Let us approach this subject on the broad basis of ultimates. Beginning in very simple terms, a whole is that which has parts. There can be no whole without parts; and no parts without a whole. Since it needs no more than two parts to make a whole, for simplicity at this point let us therefore confine our attention to wholes consisting of two parts.[1]

It can readily be seen that there are two types of wholes.

The first type is of wholes the parts of which are similar. Being similar, such parts are interchangeable complements of the whole in which they participate: or indeed of any whole so constituted. In this case neither the parts nor their wholes exhibit specific individuality. Parts constituting wholes of this type may thus be called *equities*.

The second type of whole is one the parts of which are diverse but specifically apposite complements of their whole. In contradistinction to the first type, we will call parts of this diverse nature, *specific diversities*.

1. *Wholes composed of Equities.* In the case of a whole drawn from a store of equities, *any* two can serve as complements of that whole; for, all being similar and hence interchangeable, there is nothing to choose between them. The only means of recognising such parts is by their position in Space and Time in relation to the observer.

The physicist, concerned with the material and dynamic ultimates of Space-Time, has demonstrated unequivocally the

[1] Appendix 38.

equite nature of unit parts – or quanta – encountered in the physical world. It follows that any union of parts of which the physicist may become aware must consist of parts that are equite. Still then continuing to restrict our attention to ultimates, it can be appreciated that the interchangeability of such equite parts in any union can readily render inconsiderable any whole that union might constitute. Moreover, the very similarity, or 'equity', of the parts makes it possible to engage in an analytical study of each part separately and to proceed to account their union as a simple mathematical summation of the several parts. But this procedure, as we have seen, neither embraces nor indicates the characteristics of bionomic wholes.

11. *Wholes composed of Specific Diversities.* Specifically diverse parts of a whole are essentially complements that differ from each other. They are such that in their whole each part will fit its specifically apposite part – like lock and key. Hence no part that is not apposite can fulfil the complementation of that whole.

In the bionomic realm the parts of all functional wholes are of this category. That this should be so is to be expected; for in the living world the insistent finding is not of a basic uniformity and unificity either of the parts, or of any wholes they may constitute. The uniqueness of every living entity and the fact that it maintains its wholeness throughout the continuous changes of growth, makes inescapable the recognition of the process of specific diversification as an outstanding attribute of the organismal whole and of its parts. Hence, the significance of wholes and of the diverse nature of their parts becomes not only obtrusive but of prime importance in the bionomic universe.

Both specific wholes and the specific diversity of their parts readily find their place in Memory-Will. Indeed, we have defined the content of Memory as configurations of all the specific diversities and of their specific wholes.[1]

In Memory all wholes and all parts bear the full gamut of an ineffaceable and hence of a continuous specific relatedness. Moreover organic wholes constitute 'unities' of action exhibiting their own dynamic pertaining to their whole – a phenomenon

[1] Chapter xv, p. 176.

of course only recognisable where a whole is recognisable. This dynamic manifestation of motility in Memory-Will is clearly other than that of energy demonstrable in the motion of parts in inter-se relationship in Space-Time. It is a dynamic manifest of the wholes themselves and is demonstrated in the affect of the whole on the parts and of the parts on the whole in autonomous action.

But let us return to consideration of the physicist's universe in which any and all ultimate parts are equite; e.g. quanta. It is clear that in that situation some means was essential to pick out and so make possible the identification of any one unit entity from another. Only relativity could have served that end. The very fact that relativity was absolutely essential for progress in physical science indicates the problem that faced the physicist; namely, that in the physical universe no part had any specific characteristic whereby its identity could be assured. It is not, of course, here implied that constructs arising from any union of equite parts are necessarily the 'same', but that the only means by which the ultimate entities in such a union can be identified lies in their relativity.

It might be said that in Space-Time this relativity of parts deriving from their relation to the observer, lends them specificity. But that would be a *negative specificity*. It would be the *only* specificity of units, or parts, devoid of any inherent specificity of their own.

This factor, appreciable in the physical universe and which we here are defining as negative specificity, is moreover essentially of transient nature. It has not the ineffaceability of the patterns of specificity in the bionomic world.

The attribute of negative specificity pertaining to the equities has its application throughout physical science. It applies not only to the unit of the physicist, but also to the All of physics. Since all the units, or parts , in the physical universe are equities, the consummation of all parts can itself have but negative specificity. Hence the All of the physicist cannot diclose any of the characteristics of wholeness. Thus, from the basic nature of the parts, it can be seen that the physicist's All is not the analogue of the bionomic conjugate; the bionomist's Whole.

So it would seem that in no sense is the wholeness basic to the

dimension Memory-Will approachable by the contemporary methodology of science. A major impasse.

## A Possible Solution

As a possible means of escape from this predicament, we would suggest looking more deeply into the entities of the Space-Time universe. Though it is not within our own discipline to determine any such matter, the physicist may perhaps allow the question 'Can the negative specificity attributable to the equities of physics conceal any wholeness?'

Let us begin by returning to the bionomic process of functional action. In terms of principle, in the bionomic world any entity may be regarded as spheroid: that is to say, it has a 'centre'; or, more correctly, a bi-polar axis. Each 'spheroid' (for simplicity let us call it a sphere), which divides into two, gives two spheres: not two hemi-spheres. This can be seen in any cell 'dividing' as it is called. In 'dividing', the cell – a bionomic whole – is not 'halved'. It has 'birthed' two *new* cells. Both of these cells are again centralised or axially constituted; both are wholes embracing the specificity of pattern from which they originated.

What then rounds off the 'hemity' of a division of a bionomic whole? It is the qualification of each new cell, or whole, in its actional field of unity. But this attribute of the cell belongs to it as an ethonological entity – an entity of quality.

Once again, we are led back to consideration not merely of what is done but of *how* it is done.

In this text we have repeatedly claimed a distinction between the operation of the materio-dynamic 'machine' or mechanism of the organism and the action of the functioning organism as a whole where both a specific content and specific context constitute that whole. Take, for example, the bionomic whole, or unity, the family. To 'divide' a family, separate one member from the rest, is to perform an act of social surgery on the functioning unity, or whole. When, on the other hand, one member of a family removes himself and in the course of growth mates, the result is a new family; a new 'spheroid' or whole. But in this case the old family suffers no loss of its functional wholeness:

indeed, it might be said to 'gain' by fertilisation in its own growth process – in juvenescent, creative growth. But here again we are witnessing function in an ethonological whole.

If now to continue the analogy, we take another 'sphere' representing a union of equite parts as recognisable in the physical universe, on dividing – which term here we may properly use – these divisions appear, let us say, as two hemispheres; two 'halves' or divisions of the union they constituted. The 'halves' are in essence indistinguishable from each other; though they may appear to the observer as interchangeable opposites; top/bottom, right/left, back/front, in their relation to himself. In this case it becomes possible for him as observer to view the one or the other without discriminative recognition of either: and also without concern for any order in which they may have been or are involved.

There is no denying that the 'ideal' unit for experimentation would be that 'part' which manifests no wholeness – as in terms of physics: that is to say, a 'part' that has all the characteristics of content, but absolutely no context. Although it is an 'ideal' which has proved invaluable to the practical physicist, nevertheless there does lurk in the mind the suspicion – curiously enough couched in the recognition of nature's abhorrence of a vacuum – that even the equite parts of the physical universe must, in fact, partake in a duality that constitutes for each part its own whole.

Seemingly there are no 'loose' parts in nature, for, even in the physical processes of fission, the 'learned knife' does not determine the nature of the parts that will occur – however sharp the knife's edge, however powerful the blow. There is an order in all nature which is not at the mercy of arbitrary determination; fission follows natural lines of cleavage.

Assuming for the moment that there is no content without its context – no part without its whole – it would follow that the *unit* part is essentially in the *unity* of its whole – even in physics. If that is so – if every part, whether an equity or a specific diversity, partakes in wholeness – then that whole can keep the units in alignment. This possibility we have already touched on in discussing the principle of autonomy (Chapter XII). Driven to examine the question of autonomy by reason of its promin-

ence in the world of functional action, we saw that even in mechanism we cannot escape recognition of two types of relationships: (a) the relation of the parts to each other, and (b) the relation of the parts to their whole; so giving us two factors for consideration – an *inter-se* and a *per-se* relationship. And this is no less the case however impermanent and transitory the union (or unity of the whole) in which the parts may associate.

The inter-se relation of the parts in any union (unrecognised as a whole) determines the motion of the parts automatically; i.e. without the decison of 'choice'.

But, should we be right in postulating that there can be no part without its whole, then it must be anticipated that in any union they may effect, even equite parts may also and essentially be related to each other *through that union* – an unrecognised whole. That being so, the per-se autonomous relationship would keep them in alignment by reference to their context, i.e. in their whole. So even equite parts, or the equities in any union (or operative whole) could be expected to partake in autonomy through their union.

It would seem then that we should expect even equite parts in any union to manifest in their operation, either automatic uniformity or autonomic diversity, or both, according to whether we are presented with their inter-se or their per-se relationship, or with both.

That this analysis of operative relationship does, in fact, apply even in the case of the equite parts of the physical universe would seem clear, for, though we cannot in the case of the equities 'identify' any specific diversity in the parts, both the parts and any union, however temporary, that they may assume, are nevertheless 'ordered' in any 'mass' statistically and in any 'field' statistically – as the physicist has fully demonstrated.

There is, then, some evidence for assuming that wholeness has its place – however inconspicuous – even in physical science. It may well be that Bohr's theory of complementarity or alternativity has a bearing on these twin relationships of parts – to each other and to their whole – not as yet recognised as such in the world of physical science. To speak of 'complementarity' while ignoring any whole of which the parts may be the complements,

would seem to lack reality. But, as with any illusion made here to the present position in physical science, it must be kept in mind that hitherto there has appeared no reason to recognise any such entity as 'whole'; nor to make any distinction between the All and the Whole. Neither, it must be recalled, is the physicist called upon to make any distinction between 'fact' and 'act' – with which the bionomist is faced.

There is then reason to assume that even equite parts engaged in any union are involved in wholeness – though owing to the negative specificity of the parts in the physical world, any such wholeness necessarily passes unrecognised. To make such an assumption would in no way challenge the indubitable findings of the physical scientist in the Space-Time dimension. It would however mean that wholeness would then present an universal cosmic attribute.

*The Universality of Diversity.* We have repeatedly observed diversity to be one of the characteristics of wholeness. Now if in considering the array of all possible forms of diversity, we were to exclude the apposition of equities in the formation of wholes, we should be robbing diversity of its full expression. So inevitably, we must include the apposition of equities in the formation of wholes as one type – and one *only* – in the array of all possible wholes.

At once the 'necessity' for a Space-Time universe arises: But, it is a universe in which the negative specificity of the ultimate parts enjoying union, renders any whole they may constitute unrecognisable.

From this proposition some grave implications would follow. If according to definition, Memory-Will can be accepted as that dimension of quality which embraces the configuration of all the specific diversities and of all types of whole – even those consisting of parts exhibiting but negative specificity – then Space-Time emerges as an 'inclusion' in the dimension Memory-Will. A necessary inclusion; and a special case.

Upon this hang two corollaries:

(a) while Space-Time is approachable in terms of Memory-Will, Memory-Will is not encompassable in terms of Space-Time;

(b) the full understanding of Space-Time is only ultimately to be appreciated in its relation to Memory-Will.

Such an interpretation arising out of the consideration of the nature of wholes might hold within it a possible solution of the predicament with which contemporary science is confronted as to the nature of ultimates in physical science.[1]

This would certainly clarify the respective roles of the physicist and of the bionomist. While the discipline of one would be recognisable as directed to the analysis of parts, that of the other would extend also to the synthesis of wholes. Were this acceptable as a working proposition, each could lie down to gnaw his own bone with increased zest.

## Mathematical Considerations

Perhaps the greatest difficulty in any attempt to co-ordinate Space-Time with Memory-Will lies in the inapplicability to Memory-Will of any mathematic fruitful in the consideration of quantitation in Space-Time. For instance, we have just seen that the process of mathematical division requires at least different handling and interpretation when applied to biological events as against its simpler application in materio-dynamic sequences. In bionomics we have to be concerned not merely with the quantitations of objective synthesis – the reproduction and repetition of specific characters – but also with the creation of new specific wholes appearing in the creative process of evolution.

1. *Units versus Unities.* It is clear that a mathematic based upon a 'unit' of measurement is without pertinence in respect of qualitative and creative events, for these we have seen to proceed in a 'field of unity' essentially involving the spontaneous action of the parts *and* of their whole. This 'unity' is not *one*-ness. Being the mutual mutation of two parts in respect of their whole, it essentially has a trinary, or trinitarian basis – two, and the whole they constitute. Hence, its symbol cannot be 1, nor can it be $1 + 1$, $1 \times 1$; nor yet 3. It is not in fact interpretable in any known formal manipulation of integers.

[1] Appendix 39.

Were we to have separate symbols representing the characteristics of each part, then whatever those symbols, they would have to represent the specific characters of the part in relation to the specific characters of its whole; and indicate in some way that whole as embodying the specificity brought to it by the part.

Any symbol and mathematic adopted must also allow for motivation from a single fount[1] represented in the whole and permitting of an autonomous relationship throughout whole and parts. It must not appear to lock the system being described, so rendering it a fixed one bearing only the inter-se relationships governing automatic operation.

These difficulties immediately arise with the recognition of wholes – as distinct from unions. They all stem from the trinary constitution of wholes and so escape representation in any mathematical system based upon unit integers. But for unity as yet we know of no mathematical language. Perhaps one exists somewhere already awaiting application in bionomics.[2]

There is still a further difficulty in the application of mathematics to bionomic function which we have not mentioned. We have to conceive of 'futuring' along, wholes upon wholes, in Memory-Will – rather than just 'moving about' in the 'isolation' of units in Space-Time. Hence, again, a unity of functional action in Memory-Will is unlike any transitory union that units may form in the physical world of Space-Time. The dynamic connotation of unity is of a specific orientational affect; an 'ordering' within wholes – presaging, though not determining, the future of function.

We have earlier claimed that directivity is a function of the autonomy of content/context, in wholeness.[3] In physical science, on the other hand, it is generally assumed that directivity is a function of the contentual parts. This expedient, forced on the calculator when no whole is recognisable, is, for instance, evident where the ultimate summation is called 'infinity'. Likewise, at the other end of the scale 'zero' comes to be used for an 'unknown' quantum approaching nothing. Such 'approximations' necessarily arise in the absence of any wholeness.

Memory-Will we have seen to have ineffaceability and hence

[1] Chapter v, p. 52 et seq. [2] Appendix 40. [3] Chapter xii.

eternality as its signal characteristic. It is in that dimension – a dimension covering the field of specificity and originality of wholes – that zero and infinity find meaning. Into a scale of mathematic where wholes necessitate the acceptance of unity as the basic 'integer', zero and infinity migrate easily, there taking their legitimate places as *origin* and *fulfilment*.

In such a scale of unity, 'infinity' becomes the 'reality' of the unity of the cosmic Whole containing All possible parts – to the 'futurity' of function. So defined, infinity is the ultimate Unity – the *context* of which the physicist's All is the *content*.

Likewise, zero finds meaning in the same mathematical scale. To understand this possibility let us return to the position of wholes composed of equities and consider a 'unit', the basic unit of physics for example – if, indeed, the physicist now accepts any such entity.

The unit has its content – its singularity. In any union, say of two units, the other unit in the union becomes the context of which the unit under consideration is the content. But, since no specific complementarity appears in the context and there is nothing to distinguish the one unit from the other, the content is indistinguishable from its context. If now we regard this in the qualitative terms of wholeness (content/context) the statement of the situation of the unit in respect of its context emerges as zero-unity. As so defined, zero-unity becomes the context of a unit the content of which is indistinguishable from its context.

Taking this view, zero can be regarded as a 'measure' of the unity of units – a 'measure' of quality. In a mathematic referable to the quality of wholeness, zero goes to the opposite end of the scale to infinity.

Or, from a slightly different approach, let us consider a unit in isolation; that is to say without any wholeness. Then, although it has content, it has no context other than its content. We reach the same conclusion, content = context: but, again the context is a zero point. Passing from there to two units forming a union, we can now conceive of an extension of unities on our scale of unity but still always in a negative sense. Then, recognising negative specificity, we again can ascribe the union to negative unity and so proceed to develop a scale in these

terms. This scale of negative unities would appear to be a scale relating to Space-Time geometry.

In bionomy where we are obliged to recognise a positive specific diversity, the development of a mathematic based upon unity is essential to the establishment of a functional co-ordinate. By this means we should be provided with a key to the meaning of living and so unlock the data appearing on the materio-dynamic co-ordinates of the Space-Time dimension.

11. *Choice and Chance.* The implications of migration into such a new mathematical scale are rather startling. To appreciate this, let us look at the functional co-ordinate for which a new mathematical system is essential. Here unities appear. Here the specific relation of the part to its specific whole meets with recognition. Hence here the principle of 'uncertainty' is replaced by one of the 'certainty' that attaches to specificity.

So on the functional co-ordinate we have the configurations of Memory subject to eclectivity in Will engaged in action wherein their specificity imposes 'certainty' of choice. On materio-dynamic co-ordinates we have the equite entities of Space-Time, apparently escaping the positive affect of eclectivity by reason of their negative specificity and hence appearing as operating without choice; i.e. in the field of chance recognised in physics.

For the sake of argument, were choice to arise in the Space-Time universe it could but be 'choice' of one of the All – for all are equite. Clearly in such a situation any 'choice' *must* become chance; for, faced only with equite entities from which to choose, choice ceases to have significance. But since e-lection of one from among all has to be accounted for in Space-Time, the field in which the e-lection of any one arises might without prejudice to the findings in physics be regarded as a field of negative choice. In that case, in terms of Memory-Will, the field of chance of the physical universe becomes that of *negative choice.* Again a special case; the *one* situation in which there is nothing to choose.

From that position it becomes possible to approach all phenomena in the overall light of *function of the Whole.* Then both the ordered action of organism and all systematised operation in the physical universe appear as the mutual mutation of absolute

diversity in Memory-Will arising in a bipolar field, the poles of which are, positive specificity as seen in Memory-Will and negative specificity as seen in Space-Time; each manifesting its own dynamic.

From this it would follow that energy must be conceived of as pertaining to the Whole. This is a proposition we have already considered.[1] Energy-as-a-whole then appears from one aspect, one pole, as motility referable to the specific diversities; at the other pole seen as motion referable to the equities. Motion as known to the physicist in Space-Time thus now becomes a special case of energy-as-a-whole; appearing from the opposite aspect, or pole, to motility referable to the specific diversities in Memory-Will.

From this point we may in the cursory fashion appropriate to this text, turn to brief consideration of the overall manifestation of energy-as-a-whole as viewed from each of its actional poles.

III. *Eutropy – Entropy.* Let us begin from what is directly observable. The bionomist is perpetually faced with the insistence of the living entity to build up, i.e. to 'grow' in specific diversification of structure and capability of facultisation. In this process its individuality, or wholeness, is sustained according to its own order of being. This persistent characteristic of all living things falls within the experience of all and sundry.

To the medical man, one of the most powerful forces in nature is the natural tendency to wholeness, health and healing. No elaborate experiment is necessary to demonstrate it. Prick the finger and healing – the restitution of wholeness – sets in as the needle penetrates the skin; and the process continues for hours, days or months according to the depth of the injury. Medical men discerning the actuality of this tendency have been *using* it for thousands of years. Nevertheless it is an attribute of the living world that eludes the reckonings of scientific methodology.

The physicist concerned with energy factors in Space-Time recognises in the entropy-principle a statistical tendency to disorder. That refers to the All – of equities and their motion in Space-Time; it bears no reference to wholes or to the order

[1] Chapter XIII.

evidenced in wholeness. Though a tendency to order of entities in the living world has been recognised and discussed by not a few observers, as yet there has emerged no distinctive word to confirm its own right of identity. Let us here name this attribute *Eutropy*.

Within this term the observable tendency to health, wholeness and healing comfortably finds its place: a manifestation of the eutropic principle manifest in each living entity. This tendency to the maintenance of wholes and to the origination of new wholes, finding expression in the ordering of the myriads of species, is sustained in – and sustains – the process of evolution.

We have seen that owing to the specificity and origination of bionomic wholes in the bionomic heirarchy, we have to conceive of wholes upon wholes and of wholes within wholes. Eutropy embracing that heirarchy emerges as a principle pertaining to *the Whole* – as the physicist's entropy pertains to the All of physics.

It is worth looking rather more closely at the two processes here involved.

In bionomic order the process of eclection of specific patterns in Memory-Will though strictly 'cumulative' is not a procession, linear or sequential, as in materio-dynamics. More nearly is it an 'expansion', spherical (or elipsoidal), reticulate. There has been no word for the notion 'from unity to unity'. Being trinary in initiation and in progression, it finds no place in the mathematics of cardinal or ordinal enumeration, as we have seen.[1]

Like growth, the patterns of specific diversity have the characteristic of irreversibility; they have too that of 'enduring', of 'eternality'. In this way they are to be contrasted with the equities of negative-specificity, reversible, transient, finite in Space-Time. Eutropy, positive, actional, pertinent to the overall behaviour of the specific diversities, emphasises this difference.

While the tendency to Wholeness arises with the behaviour of motility in a field of choice, the tendency to Allness arises with the behaviour of motion in a field of chance. The difference does not lie in the respective energy factors involved. It lies in the nature of the vehicle – the *content* engaged in the two cases.

[1] Appendix 41.

So the specific diversities must be recognised for what they are. They are not merely *in*-equities. Neither then may eutropy be regarded as '*negative*' entropy – as Schrödinger contests in *What is Life?*[1] In his explanation, 'order from order' is a manifestation of negative entropy. But there, order is explainable in physical terms – which do indeed pertain to the organic mechanism. Were we to accept this terminology as embracing the *maintenance* of order – which may and does occur in certain conditions as an automatic manifestation in the organic mechanism – it still eludes, side-steps, order in the emergence of originality: the origination of new 'origens'. This finds its place in the tendency to Wholeness; or eutropy as we would call it.

In this chapter we have already found that certain conditions attaching to Space-Time point to that dimension as representing a 'special case' comprised within the dimension Memory-Will, there to be accredited with negativity of the characteristics peculiar to Memory and to Will. It follows readily that the dynamics of motion in Space-Time also become a special case of motility in Memory-Will.

The significance that emerges from this is that there is no inherent antipathy between the two conventions, Space-Time and Memory-Will. The field of choice of the specific diversities in Memory-Will and the field of chance of the equite entities of Space-Time, though distinct, are not necessarily to be entertained as either contradictory, or as mutually anihilatory. The two positions can be held without prejudice the one to the other.

[1] E. Schrödinger. *What is Life?* C.U.P. 1955

# Envoi

A well-nigh lifelong search for the nature of health has led to the exploration of uncharted territory; that in which quality appears and the qualification of action arises in the living organism. While it is clear that the *means* – in all modes of existence – lies in quantitations in the dimension Space-Time, the *meaning* of living is to be found in attributes of quality not recordable in that dimension. Hence, as a preliminary device for charting the territory of quality, we have here proposed as a conceptual grid of reference, a dimension Memory-Will.

The proposition is offered as an *hypothesis for experiment* in a field which up to now has proved intractable to scientific exploration. The treatise, then, does not represent any new philosophy of life; nor is it a technical treatise holding out new methods for the maintenance of health or the prevention of disease. Our reason for putting it forward is that without means of gaining discriminate knowledge of quality, certain critical properties pertaining to health, or sanity, must remain undefined.

In the text there are set out what we have come to recognise as necessary requirements for experiment in an admittedly difficult field of enquiry. Graphically it might be said that we have attempted to sketch out a 'back-cloth', cosmic in scope, as an essential 'property' for the stage on which any lively experimental cast may play out not only the content and measure, but also the *meaning* in living.

It must be acknowledged that the conditions envisaged as essential for experiment are not trivial ones; neither are they all by any means drawn from channels of orthodoxy. Unfamilar as some are, they must prove of challenging nature. Because of its unusual character this hypothesis could not soberly have been offered for consideration until some preliminary attempt had

been made to demonstrate that experiment, within its terms, was in fact a possibility.

Hence the Peckham Experiment carried on at the Pioneer Health Centre, London, had to take priority over any statement of the hypothesis. Had the Peckham Experiment not given indications both of illumination and also of practical validity, there would have been no case nor justification for the publication of this book. So a companion volume to the foregoing text becomes a necessary adjunct to the book as a whole. Volume II will show in how far experiment based upon the human family in contemporary urban conditions has been possible; what was the behaviour of the material under study; what, if any, were the findings to support the presumption of the validity of the hypothesis as a guide to experimental procedure.

In the authors' opinion the present volume has little significance unless it leads to the opening up of new paths for experiment. Apart from such a use the foregoing treatise can only be regarded as but a poor parody of *Alice Through the Looking Glass* – phantasy of a strange unrecognisable world open only to the innocence of a child.

# DICTIONARY OF QUALITY

# Dictionary of Quality

Asterisks refer to those entities presenting a negative aspect of quality and of qualification.

ACTION-PATTERN

: the 'mss' of functional action (q.v.) seen in the living entity under observation: deriving from exercise of faculty for individuality.

: record of the specificity and uniqueness of the organism and of its use of the content of Memory in its specific and unique inhabitation – so, a means of assessing quality (q.v.).

: hence a phenomenon present in the 'here' and 'now', yielding evidence of the organism's locus in Memory-Will.

: indication of the affect of the functionary (q.v.) in the autonomous orientation of order in organism and environment: a record of 'how' the organism is using what the organic mechanism can do (cf. capability).

: an indication of health: so, change in action-pattern often the earliest clinical sign indicating a change in states of existence: e.g. a declension from health – i.e. functional existence (q.v.) – to that of compensative existence and/or to the onset of disease.

: arises with the organism's autonomous action within its inhabitation, so, to be distinguished from patterns of 'behaviour' referable to the operation of the organic mechanism irrespective of conditions upon which autonomous action depends.

ACTUAL/ACTUALITY

: as 'factual' refers to the demonstrably measurable physical capacity of the organic mechanism, so 'actual' refers to bionomic capability (q.v.) of organism for functional action: e.g. the infant

at birth has factual 'capacity' for digestion but not actual 'capability' to digest.
: refers to the mode in which a specific and unique organism under direction of the functionary utilises that which is available for the performance of the organic mechanism.
: not assessable in Space-Time terms alone.
*vide* Functional Needs Field of Opportunity

AESTHESIA *(S.O.E.D. Gr. 'the perception of the external world by the senses' – hence in early use not distinguished from sensation: in later use embracing 'feelings' – e.g. aesthetics.)*
: constitutes the body of organismal imperience (q.v.) – loves, likes, tastes etc. – whereby choice in action ensues. Preponderantly beyond conscious appreciation; recognisable as 'feelings' only when consciously appreciated.
: arises in association with motility (q.v.) in Memory-Will; whence appreciable by the sensibility of the organism; affects orientative change in the operation of the organic mechanism; hence a post hoc 'evidence' in organism of motility in Memory-Will.
: transmitted to the aesthetico-directive system (yolk sac – q.v.) cf. sensory-motor system associated with sensation.
: hence, as sensation is related to the in-flow at the external environmental surfaces of the body, so aesthesia is to be related to the out-flow at the internal environmental (membranous) surfaces: 'own-spun' contribution of organism in mutual synthesis.
: participates in the basic bipolarity of functional action – the poles being sensation/aesthesia.
: the study of 'aesthetics' becomes the study of the dynamic, eclectivity (q.v.) appreciable in the dimension Memory-Will.

AESTHETICO-DIRECTIVE SYSTEM
: internal system in the organic mechanism associated with aesthesia, as sensory-motor system is associated with sensation.
: arises embryologically from derivatives of yolk sac membrane and has its own autonomic nervous system associated with the brain.
: provides mechanism whereby functional action proceeds in the bipolar field – sensation/aesthesia.

ALTRUITY
: attribute of bionomic order; hence also of eutropy.
: arises as a field (of influence) in association with autonomous

orientation of the whole inhabitation (organism and environment) – in field of unity (q.v.) in Memory-Will.
: recognisable in association with mutuality of action of all parts in per-se relation to their whole: hence spontaneously fulfilling the functional needs (q.v.) of every part and of the whole.
: contrast with the 'egotism' of unipolar action deriving from inter-se relationships not subject to autonomous action involving the affect of the whole.
: widely exercised, but unrecognised, in common action, e.g. pedestrian traffic in a busy street.
*vide* Autonomy Subjective Specific Synthesis

APPETITE FOR UNITY
: aesthetic (q.v.) manifest of 'pull' of specific apposite diversities in a 'field of unity' in Memory-Will: the prescience in the organism of eclectivity in the creation of a new specific whole in Memory-Will.

ATTENTION
: the mode of approach permissive of the affect of Memory-Will on the action of the directible organic mechanism.
: the non-determinative 'view' of a living entity of the content of Memory which opens the total diversity of the inhabitation for spontaneous eclective choice in fulfilment of the functional needs (q.v.) of both organism and environment.
: the mode of action that attends creative subjective synthesis (q.v.) in contrast to 'primary focus' (q.v.) by the entity on a pre-determined objective which, short circuiting eclectivity, leads to objective specific synthesis.
*vide* Utilisation Order

AUTONOMY
: principle according to which parts in relatively 'free' association with their whole, i.e. in *per-se* relation, endow parts and whole with enhanced actional excursion in virtue of the affect of the diversity of the context (environment) upon the 'free' parts.
: hence refers to government of the whole in virtue of the relative freedom of its parts.
: while the *per-se* relation of parts to their whole is conspicuous in the organism as an ethonological whole—e.g. cells in the body of their inhabitation or the members of a family within their home – it is

also represented in the mechanism (e.g. bogie wheels) and pertains equally to the organic mechanism.
: hence gives to the organic mechanism the attribute of directibility (q.v.).
: of supreme importance in bionomy, wherein the organism in functional action is seen as in mutual actional relationship with its environment in the spontaneous flux of diversification. (NB. not to be confused with the physiologist's term 'autonomic' referring to involuntary' action.)
*vide* Will Order Ethonomy

BIONOMY *(S.O.E.D. Gr. nomos, bios. . . .)*
: the study of organism in its cosmic reference embracing the laws of locus and qualification of functional wholes – cf. astronomy, the study of the laws or science of cosmic bodies.
: study of the laws of living as inhering in the cosmic whole and in all lesser wholes and their parts seen in their inhabitation.
: study also of order (q.v.) arising in a 'field of choice' (q.v.); and as expressed in system (q.v.) arising in a 'field of chance' (negative choice).
: contrast with biology – the study of organism without reference to ethonological wholes, and so without scientific reference to the essence of wholeness.

BIPOLARITY
: attribute of functional action peculiar to wholeness.
: refers to the specific appositeness and hence to the dynamic eclectic 'charge' of two poles of a 'field of unity' (q.v.) in Memory-Will, so creating a new whole of specific quality through spontaneous mutual mutation in the process of synthesis.
: provided for in the morphology of the organic mechanism by duality of all organic features both in the physical body of the individual and in the duality of sex in the mated pair – the functionally mature organism.
: underlies the trinitarian constitution of function proceeding in 'fields of unity' (q.v.) in bionomic order.
*vide* Function Facultisation Unity Trinity also Choice

CAPABILITY
: ability to utilise the physiological equipment of the organic mechanism (capacity q.v.) to meet the specific needs of the entity as a

whole; hence *how* the living entity does *what* the organic mechanism can do.
: arises with facultisation.
: associated with a qualitative process in Memory-Will.
: unlike capacity (q.v.) neither quantitatively nor statistically assessable: c.f. 'factual' and 'actual'.

CAPACITY
: capacity . . . for operation, the analytical measure (factual) of the physiological equipment of an organic mechanism: the 'what' can be done by the organic mechanism irrespective of the facultisation of the living entity (q.v.).
: quantitatively assessable.
: contrast with capability (q.v.).

CHANCE*
: a cosmic regularity manifest in motion in Space-Time and arising in association with universe of equities (q.v.).
: the negative pole of a cosmic field of Choice (q.v.).
: a 'chance': contrast with an 'opportunity' (q.v.).

CHOICE
: appreciable in association with a universe of specific diversities (q.v.) in Memory-Will.
: concerns mode of motility (q.v.) of 'entities' in the dimension Memory-Will, whereby the specific and diverse configurations in Memory move to each other eclectively in virtue of the absoluteness of their specific appositeness.
: 'field of choice': that in which bionomic order is initiated with the 'certainty' that characterises Choice. Contrast with 'field of chance' in which motion of equities (q.v.) (between which there is nothing to choose), proceeds according to system (q.v.) governed by the law of probability.
: as probability inheres in chance, so certainty is synonymous with choice.
: constitutes a cosmic attribute of the dimension, Memory-Will (cf. Chance in relation to Space-Time).
: embraces 'chance' as a 'special case' – the negative of which choice is the positive: hence in no way negates the laws of 'chance' in Space-Time and the regularities of its behaviour. The positive and negative aspects of a 'field of choice'—Choice/Chance – together

represent two poles of the field of unity of cosmic function – the attribute of which is bionomic order (q.v.).

*vide* Will Bipolarity Unity Order Eutropy

CO-ECLECTION

: an attribute of the dimension Memory-Will (cf. conservation in Space-Time).

: derives from eclectivity, spontaneously engendering new specific wholes in the content of Memory (q.v.).

: this creation of wholes upon wholes in differation (q.v.) of the memorial content not being repetitive, additive nor aggregative, each new whole is a 'novelty' – i.e. of new specificity – not ousting but embracing the specific patterns of which it is created: hence no pattern ever lost in the ineffaceability of Memory (q.v.).

COMPENSATIVE EXISTENCE* ('SURVIVAL')

: a declension from health or functional action (q.v.).

: that state of an organism or organic entity in which in face of a defect or deficiency in its mechanism or/and in its environment, it sustains its position by diversion of its physiological reserves and/or by limitation of its excursion in the environment to compensate for those defects or deficiencies.

: hence a state of existence depriving it of autonomous action in response to the full diversity of the environment; thereby setting a limit to the possibilities of fulfilling its functional needs (q.v.) as in health (q.v.).

: clinically, a state of existence without 'symptoms'.

: bionomically, manifest in a declension from the action-pattern of health.

: contrast with Health and Disease (q.v.).

COSMIC ORGANISM

: the bionomic Whole, conceptually envisaged as 'alive' – organismal – acting in mutual synthesis by reason of autonomous constitution of parts and whole – so manifesting bionomic order in action.

: differs from lesser organisms – its contentual parts – in that while they appear as having an endogenous content and an exogenous context, the greater organism – an all-embracing whole – is necessarily wholly endogenous – or contentual.

: hence while mutual synthesis in all lesser organisms involves the conversion of an exogenous alien context into its own 'familiar'

endogenous content, so leading to an entity of increasingly homologised quality; in the cosmic organism such synthesis in bipolarity of action in a field of unity (q.v.) is envisaged as deriving from the dual directionality axifugal/axipetal – of the dynamic of the whole – i.e. energy/emurgy, so leading to further differation (q.v.) of 'eternally' homologous content (cf. co-eclection in Memory).

: so the cosmic organism, no less than all lesser organisms, is seen as of trinitarian nature in the function of living.

*vide* Order Whole Trinity Ethology

DIFFERATION

: a process in Memory-Will deriving from eclectivity, whereby are created new specific configurations in the content of Memory, but without obliteration of the specific diverse configurations from which the new arise.

: process giving to the dimension Memory-Will its attribute of co-eclection (q.v.).

: essentially a process of qualification: hence not to be confused with – though ultimately to be co-related with – differentiation seen in quantitative material manifestations in organism as viewed in the Space-Time dimension.

DIRECTIVITY

: a property resident in a certain category of mechanism depending upon the constitution of that mechanism as a whole bearing 'free' parts, i.e. parts in *per-se* relation to their whole; so making possible the autonomous operation of the mechanism as a whole in relation to the diversity of the environment.

: a property conspicuous in the organic mechanism: so rendering the organism subject to 'direction' by the functionary (q.v.).

: a pre-requisite of bionomic order (q.v.).

*vide* Autonomy Functionary

DISEASE*

: a subjective manifestation in the organic entity deriving from its inability to function as a whole in its locus in Space-Time and/or in Memory-Will.

: clinically, the manifest (i.e. symptom) of disorder in the organic entity and/or in its inhabitation in its locus in Space-Time or Memory-Will.

: arises with failure of the compensatory capacity or capability of the

organic entity to meet the exigencies of disorder in the organic mechanism or in the environment; hence objectively appears as decompensative existence.

*vide* Ease Compensative existence

EASE

: the mode of organism functioning in mutual synthesis with its environment: i.e. in health.
: an attribute of bionomic order (q.v.) manifest in action-pattern (q.v.) of functional action(q.v.).
: subjectively appreciated becomes 'feeling of ease' – the aesthetic appreciation of the acceptance of an eclectic event in Memory-Will fulfilling the organism's functional need (q.v.) by 'choice' (q.v.).

ECLECTIVITY

: a 'dynamic' in the dimension Memory-Will, manifest in 'pull' between two specific diversities in virtue of their specific appositeness inducing a 'field of unity' (Memory-Will) in which mutuality of synthesis engenders a new and diverse specific memorial whole.
: each specific diversity in the content of Memory carries its own 'charge' of eclectivity prevenient of further unity – potential of further motility – in Memory-Will, so changing its content co-eclectively. cf. co-eclection.
: the motility associated with eclectivity in Memory-Will, being spontaneous, is to be distinguished from the phenomenon of motion – in Space-Time.
: governed by spontaneity in a field of choice (q.v.), in Memory-Will, to be contrasted with energy manifestations obeying law of probability in field of chance in Space-Time.
: the orientating dynamic underlying bionomic order.
: the initiating factor of aesthesia in organism, whereby the qualitative pattern of the internal environmental (yolk sac: q.v.) content of the organic mechanism is elaborated.
: a pre-requisite in the bipolarity of functional action involving sensation/aesthesia: subjectively appreciable as 'feelings' (q.v.).
: evidenced in the action-pattern of functional action and in creativity in action with the emergence of novelty.

*vide* Mutual synthesis Aesthesia Will Choice Order

EMURGY

: an aspect of cosmic Energy deriving from the whole: characterised by directionality—from without-in of the whole.

: to be contrasted with the aspect of Energy as known in physical science—motion of part to part or all parts; i.e. from within-out of the whole.
: by hypothesis, constitutes with energy (physics) cosmic energy-as-a-whole whereby the two dynamic directionalities in bipolarity of action in a field of unity (q.v.) in Memory-Will, engender a tendency to eutropy (q.v.).
: affective of orientation of action of the organism: as opposed to the effective motivation of the organic mechanism.

*vide* Cosmic organism Unity Eutropy

EQUITIES*

: entities characteristic of the content of Space-Time; to be contrasted with the configurations of the specific diversities (q.v.) constituting content of Memory-Will (q.v.).
: parts of one category of wholes: a 'special case' in which neither part (nor whole) has recognisable specificity (cf. quanta) – hence basically approachable as 'units' recognisable only by their Space-Time relativities.
: operate in system (q.v.) of sequences according to law of probability and chance; manifest no individual order, their specificity being negative (q.v.); but ordered statistically in mass.

*vide* Whole Memory-Will Bionomy Chance Choice

ETERNALITY

: a cosmic attribute of Memory-Will.
: inherent in the ineffaceability of the memorial content throughout change (qualitative).
: to be associated with spontaneity; an attribute of Will – not referable to Time.

ETHOLOGY

: a department of bionomy (q.v.) concerned with the study of the processes underlying ease (q.v.) and order (q.v.) in the mutuality of functional action of organism-and-environment.
: the study of health appreciated as a positive process obeying its own laws and regularities in Memory-Will and in Space-Time.
: contrast with pathology, the other department of bionomy – the study of processes underlying dis-ease and dis-order.
NB. not to be confused with modern biological usage covering the study of the 'behaviour' of organism in its environment, without

appreciation of the several operational modes open to organism (health, compensative and de-compensative existence).

ETHONOMY

: that science, awaiting development, which pertains to 'realities' referable to Memory-Will – i.e. ethonological wholes and their autonomous action within the whole – e.g. the cell in the body of its inhabitation; the members of the family in its home.

EUTROPY

: the tendency to actional order (q.v.) in the bionomic world; cf. entropy – the tendency to statistical disorder in the physical world.
: an attribute of specific wholes and the Whole.
: arises in a field of choice (q.v.) – the cosmic bipolar field of unity, of energy – emurgy (hypothesis).

*vide* Emurgy Unity Order

FACULTISATION

: concerns 'how' the organism does 'what' can be done through the use of its organic mechanism.
: hence the development of capability (q.v.) in the organism to use the physiological capacity (q.v.) of its organic mechanism.
: though effected through materio-dynamic operation of the organic mechanism, depends basically upon the eclectic use of patterns of specificity housed in Memory-Will.
: essentially a qualitative process – the growing ability of the unique organic entity to convert a heterologous alien environmental context into its own homologous specific content.
: proceeds in bipolarity – morphological and actional – characteristic of all function: the morphological basis for such bipolarity of action being resident in the duality of the features of the organic mechanism; the actional poles deriving from sensation/aesthesia.
: hence a process involving synthesis of two contributions accepted by organism; one from the external environmental threshold through the sense receptor mechanism; the other from the internal environmental threshold (q.v.) through the aesthetico-directive system (q.v.) initiation of action arising from either pole.
: process by which 'personality' develops into 'individuality' (q.v.). not comprehensible in terms of Space-Time without reference to Memory-Will – hence demands functional co-ordinate (q.v.)

FACULTY

: an organism's ability for discriminate use in Memory-Will and Space-Time of any of the variety of diverse capacities available for functional action.
: arises with the differentiation in the organic mechanism of morphological sites (features) in which the capacity for specific and discriminative function in relation to a particular factor, is potential or pronounced.
: hence convenient for experimental hypothesis to classify the faculties according to the morphological 'features' representing any such capacities: *external* faculties, primarily associated with sense reception; *internal* faculties, primarily associated with aesthetic imperience; faculties exhibiting a *dual* function, external and internal (e.g. faculty for genesis); or overall faculty of organism for maintenance of the individuality of its unity).
: functions, in whatever scale, in bipolar field of unity (q.v.) (e.g. two eyes – vision; male and female – organism-as a-whole).

*vide* Facultisation Sensation Aesthesia

FACULTY FOR ECLECTION

: internal faculty; capability for acceptance of the affect of eclectivity in Memory-Will.
: appreciable in aesthesia (so, 'feeling' of having made 'choice').
: induces change in biochemical and biophysical content at internal environmental surface – yolk sac derivatives of the organic mechanism (hypothesis).
: manifest in action-pattern.

*vide* Eclectivity Aesthesia Aesthetico-directive system

FACULTY FOR GENESIS

: dual faculty pertaining to functioning organism as an ethonological whole, i.e. male and female as in a 'family'.
: functionally bi-valent, carrying characteristics of both internal (growth) and external (reproductive) faculties; the internal finding expression in the maturing of the individual, the external in family in the fulfilment of its creative and nurtural function.

*vide* Family Home

FACULTY FOR MAINTENANCE OF INDIVIDUALITY OF UNITY

: the prime faculty of all organism, involving the orchestration of all lesser faculties in unity of action of the whole.

: hence the overall faculty of organism as a whole for mutual synthesis of organism-and-environment in terms of Memory-Will and Space-Time.
: sustains bionomic order in the organism-and-its-environment.
: prime faculty sustaining health.

FACULTY FOR RE-COLLECTION

: ability to register specific configurations in Memory.
: may, as in subjective mutual synthesis, be exercised spontaneously on the memorial content in 'recognising' that to which the organism is specifically and presently related (autonomously). Or, as in objective specific sythesis, in se-lection from the content of Memory, a post hoc process of re-collecting automatically that which has formed the content of previous eclection in Memory-Will. Hence, while always involved in use of memorial content, may be exercised with or without the spontaneous engagement of eclectivity (choice) in Memory-Will; so in synthesis resulting either in novelty, i.e. creation, or in repetition and prolifieration of the same.
: not necessarily consciously appreciable. If so, here referred to as 're-membrance'.

FAMILY

: represents the functioning (q.v.) organism-as-a-whole, that whole being composed of its two diverse but apposite specific parts – the male and female individuals.
: refers to the mated pair, with or as yet without a complement of children.
: in this use, essentially a qualitative term referring to an ethonological unity (q.v.) in Memory-Will which, seen in its 'home'— its context, constitutes the basic 'unit', i.e. functional unity, of the species.
: hence the basic functional material proper to a science of sociology.
: 'familiar': being within a field of group-specificity; e.g. cells in the body of their inhabitation.

*vide* Faculty for genesis Home Ethonomy

FEELINGS

: that part – very limited – of the aesthetic content of organism consciously appreciated.
: vary widely from individual to individual according to the degree

of discriminative development and facultisation of the aesthetic (i.e. internal) faculties.
*vide* Aesthesia.

FIELD OF CHOICE
*vide* Choice

FIELD OF OPPORTUNITY
*vide* Opportunity
: contrast with 'a chance' – that in the environment which is without specific appositeness to the unique specific needs of the individual.

FIELD OF UNITY
: field in which mutual synthesis arises.
: a dynamic 'field' in Memory-Will, induced eclectively (q.v.) by the appositeness of the specific diversities in the creation of a new specific whole.
: essentially bipolar, having dynamic directionality from within-out and without-in (Energy/Emurgy, q.v.).
: as many 'fields' in any whole as there are individualities within that whole (e.g. each cell in the body functions in its own field of unity, the poles of which are that of its own individuality and that of the body of its inhabitation). Hence, only specific factor common to all suchfields is that deriving from the inhabitation (or whole).
: associated with motility in Memory-Will, demands a new mathematic of quality.
*vide* Whole Unity Mutual Synthesis Altruity

FREEDOM
: characteristic of the ability to act autonomously within a whole – hence essentially 'limited' (qualified) by relation to that whole.
: implemented through 'free' (but not loose) autonomous parts in *per-se* relation to their whole.
: attribute of all functional action on whatever scale.
*vide* Autonomy Order

FUNCTION (FUNCTIONAL ACTION)
: action manifest in the materio-dynamic sequential operation of the organic mechanism as orientated by the organism as an ethonol-

ogical (q.v.) whole in virtue of its locus in Memory-Will. Hence to be distinguished from *operation* of the organic mechanism, the machine or instrument through which function is manifest.

: the orientative affect in such action derives from eclectivity (q.v.) giving rise to mutuality of synthesis within the whole – organism and environment – so 'directing' the directible organic mechanism according to the qualitative specific and unique needs (q.v.) of a unique organism in its unique inhabitation.

: hence the actional expression of wholeness of organism and environment in the qualitative use of the quantitative capacities of the organic mechanism.

: induces action in bionomic order.

: is neither 'causal' nor 'effective' nor has quantitative significance; hence not recordable on the materio-dynamic co-ordinates.

: requires a further co-ordinate – the functional co-ordinate (q.v.).

: initiated in a bipolar field of unity (q.v.) in Memory-Will from the trinitarian basis of wholeness, so involving the action of 'unity' (q.v.); not, therefore, assessable in any mathematical system based upon the manipulation of units.

: the mode of action which sustains health, so to be distinguished from processes underlying compensative existence (q.v.) and disease (q.v.).

*vide* Health Functionary Directivity Quality Whole Bipolarity Trinity Unity

FUNCTIONAL CO-ORDINATE

: requisite for recording quality of wholes and qualification in wholeness; hence furthering discriminative appreciation of qualitative attributes of organism referable to the dimension Memory-Will.

: necessary for an understanding of the meaning of living; not as substitute for materio-dynamic co-ordinates in use in physical science, but complementary to, and ultimately to be co-related with them.

: invokes a new mathematic of 'unity', as yet undeveloped.

FUNCTIONAL EXISTENCE

: the mode of existence to be associated with functional action (q.v.).

: here defined as mode of living synonymous with health (q.v.).

: to be distinguished from compensative existence (q.v.) or 'survival', and from de-compensative existence or 'dis-ease' (q.v.).

FUNCTIONARY
: symbol for the 'director' of the directible organic mechanism.
: the 'presence' – of organism (q.v.) in its locus in Memory-Will.
: induces bionomic order (q.v.) in materio-dynamic system (q.v.) in virtue of the qualificatory autonomous orientation of the operational sequences of the organic mechanism.

*vide* Autonomy Function Aesthesia

GHOST OF WHOLENESS
: the presence of the content of the ethonological whole in Memory-Will with reference to its affect on the parts.
: hence potentially orientative of organismal action in Space-Time materialisation.

GNOMIC *(Gr. gignoskein)*
: essentially a 'knowing' derived from location of the organism in its inhabitation, i.e. the whole, and implying a certain awareness of relationship to the whole: so, awareness in organism or any part thereof of its relations in Memory-Will and and Space-time.

GROWTH
: the overall capacity of all living entities for specific irreversible change.
: presents two major aspects – senescence/juvenescence (q.v.).

HEALTH *(AS. haelph; root – hal – whole; as also in hale, holy)*
: the qualitative attribute of wholeness, enjoining the mutual synthesis of organism and environment.
: expressed in functional action (q.v.) and involving bionomic order (q.v.).
: only to be understood in terms of process in the ethonological body or whole (Memory-Will) as well as in that of the physical body (Space-Time).
: demands its own science of ethology – the study of ease and order in wholeness – in antithesis to pathology, the study of disease and disorder, both expressions of a declension from wholeness.
: bears no relation to 'normality' – a term used in medicine, physiology and sociology.
: intrinsically and distinctively a positive process not definable in terms of 'absence' of disease and/or disorder; hence not attainable

through a 'preventive' approach necessarily directed to securing the absence of disease and disorder.
: demands a new functional co-ordinate (q.v.).
*vide* Functional Existence Ethology

HOME
: the locus of a functioning bisexual organism within a field of specificity congenial to all members of that family.
: a zone presenting a surface of exchange through which the heterology of the environment is, through congeniality, convertible into an homologous content for each of the contained members of the family or group.
: provides nurtural inheritance of new personalities (q.v.).
: family-in-its-home represents the ethonological (q.v.) cell of community, of which 'family' may be regarded as the actional 'nucleus'.
*vide* Family Nurture

INDIVIDUALITY
: the unfolding of the personality (q.v.) through the qualifying process of facultisation (q.v.).

IMPERIENCE
: in organism, prescience deriving from aesthesia (Memory-Will); cf. 'experience' commonly regarded as derivable from sensation.
*vide* Eclectivity Aesthesia Yolk sac Aesthetico-Directive System

INTERNAL ENVIRONMENT
: referable to that content of the living entity associated with aesthetic imperience (q.v.) progressively accumulating from eclectivity (Memory-Will) (hypothesis).
: in this sense, presents or subtends, a 'chosen' content representing the element of 'self' – the entity's own-spun contribution to its synthesis with the environment.
: hence, that from which stems the factor in organismal synthesis bringing about the progressive homologising of the heterology of the (external) environment.
: bounded by derivatives of the functioning membrane of the primitive embryonic yolk sac (hypothesis).
: associated with an aesthetico-directive system; cf. the external environmental surface associated with sensory-motor system: so that the impact of sensation at the external environmental surface and (by hypothesis) the impact of aesthesia at the internal

environmental surface, are both accompanied by changes in the materio-dynamic constitution of the organic mechanism.
: in the bipolarity of functional action the two constitute the poles, aesthesia-sensation, of the major functional field of unity (q.v.) in the organic mechanism.
*vide* Aesthesia Facultisation

JUVENESCENCE
: an aspect of Growth (q.v.).
: the unfolding in organism of bisexuality through the content acquiring an adherent contextual complement of diverse sex.
: sustains creation to fulfilment.
: contrast with Senescence (q.v.).

MEMORY *(L. Memoria. Also see Skr. smer or smar = to love)*
: a cosmic medium referable to quality (q.v.) housing the configurations of the specific diversities and their specific wholes.
: has the attribute of ineffaceability – hence eternality (q.v.) of the Memorial content.
: associated with Will, so permitting a conceptual a 'grid' of reference through which quality and the process of qualification may become accountable.
: demands a new co-ordinate (functional co-ordinate) (q.v.).
: includes physicist's Space – seen as that aspect of Memory housing the non-specific equities (q.v.) – i.e. quanta.
*vide* Memory-Will Co-eclection

MEMORY-WILL
: conceptual dimension having reference to the bionomic universe in respect of quality and the qualification of action.
: bears reference to the configurations of the specific diversities (q.v.) and to their motility (q.v.) in the creation of new specific wholes (q.v.).
: conspicuous as revealing wholes and the whole recognisable in the relation of specific parts to each other and to their specific wholes; also revealing their motility in the 'certainty' with which apposite specific diversities move eclectively (q.v.) in a field of Choice (q.v.).
: a dimension facilitating the qualitative assessment of specific diversities and specific diversification; so essential for the comprehension of bionomic order (q.v.), and eutropy (q.v.).

: provides the frame of reference for a functional co-ordinate (q.v.) bearing records of the characteristics peculiar to functional action dependent on wholeness (q.v.).
: to be distinguished from Space-Time:
  (a) by the nature of its content specific; diversities (q.v.) in Memory-Will; equities (q.v.) in Space-Time.
  (b) by the nature of its dynamic manifestations essentially associated with wholes – and *the whole* in spontaneous (q.v.), motility (q.v.) in Will, in contrast to motion of the parts and of the *all* of parts in the sequences of Time: the one governed by 'certainty' in a field of Choice (q.v.); the other by the laws of probability in a field of Chance (q.v.).
  (c) by its co-eclective attribute – expressed in the differation (q.v.) of the specific content of Memory due to motility in Memory-Will, in contrast to the ephemeral modification of the content of Space due to motion in Space-Time – a merely conservational attribute: the one tending to eutropy (q.v.) actional and positive in the orientation of order (q.v.); the other tending to entropy (q.v.) statistical and negative in respect of order.

*vide* Whole Quality Motility Ethonomy

MOTILITY

: manifest of dynamic in Memory-Will arising in a field of unity in that dimension.
: to be distinguished from motion in Space-Time.

*vide* Eclectivity Differation Choice Eutropy

MUTUAL SYNTHESIS

: characteristic mode of action inhering in wholeness and essentially involving organism and environment; hence expressed in functional action (q.v.) in Memory-Will and Space-Time.
: spontaneously initiated in Memory-Will, the quality of mutuality inhering in synthesis through complementation of apposite specific diversities (Memory-Will).
: to be sought in zone of mutuality (q.v.).
: basic actional expression of health: manifest in action-pattern (q.v.) of ease and order (q.v.).
: not recordable on materio-dynamic co-ordinates; requires a functional co-ordinate.

*vide* Health Function Order Altruity Eclectivity

NEEDS

: that apposite specific diversity required by the unique organism at each progressive phase in the maturation of its individuality (q.v.), as complemental to the specificity of its own content for its functional action in mutual synthesis (q.v.).
: hence a means of fulfilling its bionomic potentiality for order within its inhabitation.
: what the organism will *act*ually utilise in functional action; met by eclectivity in a field of Choice (q.v.); not assessable statistically.
: appreciable through aesthesia (q.v.) – conscious or unconscious – and when fulfilled accompanied by a 'feeling of ease' (q.v.).
: contrast with 'wants' which, arising in the absence of mutuality of functional action and hence devoid of eclectivity, are met by self determined selection of material for synthesis from the content of Memory, employing the mode of primary focus (q.v.).
: wants, being non-specific and without orientation in respect of functional needs, are expressed in compensatory excess and/or disease.

NEUROTRODAL GLAND

: a glandular site in the body at which the aesthetic content of the internal environment is brought into association with the automatic nervous system; e.g. parathyroid.

NILLING

*vide* Willing – Nilling

NURTURAL INHERITANCE

: the group specific context (parental) in which the young of a species are conceived and spontaneously nurtured (womb, hearth, home, nest, sett, etc.).
: contrast with genetic inheritance – the content of the genes derived from the parenthood.
: a bionomic factor essential to qualification in the living entity.

*vide* Family Home Personality

NURTURE

: a qualitative process in bionomy pertaining to the immature individual within an ethonological whole – the family.
: arises in the spontaneous ordering of the home (Memory-Will) to

meet the needs (q.v.) of the immature individual in relation to the total situation of all the members of the family; continuous up to phase of individual maturity.
: an expression of the faculty for genesis of parenthood in the family.
: appreciable as action-pattern in the family in its home in terms of its ethonological quality.
*vide* Family Home

OBJECTIVE SPECIFIC SYNTHESIS
: characterised by the organism's method of use of the content of Memory.
: category of synthesis deriving from se-lection of a memorial content by the entity whereby synthesis, arising in a field of unipolarity, evades the orientative affect of the bipolar field of unity engendered by eclectivity.
: arises from the entity's use of primary focus (q.v.) as the mode of initiating synthesis, so himself assuming direction of the directible organic machine; viz. use of the content of Memory by the individual exclusive of the orientation derivable from the whole in altruity of action.
: offers no progressive fulfilment of bionomic needs; issues in repetition and proliferation but by-passes creation or novelty.
: contrast with subjective specific synthesis.

OPPORTUNITY
: arises with the availability in the environment of that which, being specifically apposite to the particular organism, may be used in mutual synthesis (q.v.) in the fulfilment of its own functional need (q.v.).
: contrast with a 'chance', which, while apparently presenting a profusion of material, offers no 'opportunity' either by reason of the absence of any specific appositeness, or through inability of an unfacultised organism to recognise or to use it.
: essentially dependent upon qualificatory factors in organism and its inhabitation – e.g. congeniality of home.
*vide* Eclectivity 'Field of Choice'

ORDER
: cosmic attribute of wholeness (Memory-Will).
: derives from autonomous action of organism in mutual synthesis with environment; appreciable on every scale of functional action of organism-and-environment.

: initiated spontaneously by eclectivity in field of unity (Will) from the apposition of specific configurations (Memory).
: basic to health: due to the affect of the field of unity of organismal whole (Memory-Will) on the directible materio-dynamic mechanism.
: seen in action-pattern (q.v.) of organism-and-environment as a whole; the action-pattern characterised by 'ease' (q.v.).
: recordable on functional co-ordinate only.
: contrast with System (q.v.) (Space-Time).
*vide* Function Functionary Ethonomy Eutropy

ORGANISM
: entity manifesting qualitative attributes and relationships in Memory-Will and quantitative manifestations in Space-Time.
: in bi-sexual forms consists of male and female in the maturity of functional action as family – an ethonometric entity in Memory-Will.
: entity subject to eutropy.

PERSONALITY
: the uniqueness of a living entity dependent upon its inheritance of (a) a specific genetic content (b) a specific nurtural (q.v.) context.
*vide* Individuality Facultisation

PRESENCE
: locus of 'realities' (q.v.) as they arise in the spontaneity (q.v.) and eternality (q.v.) of Memory-Will.
: compare with 'present', locus of materialities as they arise in materio-dynamic sequence in Space-Time.
*vide* Memory-Will Functionary

PRIMARY FOCUS
*vide* Attention Objective specific synthesis

QUALITY
: attribute of the patterns of specificity – in and appreciable in Memory-Will.
: while quantity is used with reference to equities (q.v.) and/or their motion in Space-Time in virtue of a measurability based on their relativity to the position of the observer, quality is used with reference to the subjective appreciation of specific configurations in Memory and their motility in Will, in virtue of the specificity and

appositeness of their mutual relatedness within and to their specific whole.
: while quantity is referable to part and to *all* parts, quality is not appreciable in parts or the All of parts, a-part from their specific wholes – and the whole.
: essential to the understanding of bionomic order.
: subjectively, appreciable as aesthesia; objectively, in action-pattern in every scale of function.
: not recordable on the materio-dynamic co-ordinates; demanding functional co-ordinate (q.v.).
: not expressible in terms of mathematic based upon 'unit'; awaits mathematical system having its basis in 'unity' (q.v.).
*vide* Memory-Will Specificity Order

REALITIES
: entities in Memory-Will. Contrast with 'materialities' entities measurable in Space-Time.

RE-COLLECTION
*vide* Faculty for Recollection

SENESCENCE
: an aspect of Growth (q.v.).
: the unfolding in the living entity of a contentual potentiality deriving from its inherent bisexuality.
: sustains a contiguate process of propagation to extension; contrast with Juvenescence – sustaining creation to fulfilment.

SENSATION
: that through which there is registrable the effects of re-action between materio-dynamic bodies (e.g. light on a photographic plate; pinprick on the surface of the skin).
: hence deducible as a cosmic attribute not confined to organism.
: in organism, registers materio-dynamic events due to impacts of the environment, at a sense-receptor surface – the sensation only becoming significant to that organism when complemented by aesthesia from within; i.e. through facultisation in a bipolar field of function; sensation/aesthesia.
*vide* Aesthesia

SENSIBILITY

: an attribute of the cosmic organism (hypothesis); as of all lesser organisms – its organic 'parts'.
: the overall attribute of organism giving rise to the possibility of facultisation (q.v.).
: underlies both sensory and aesthetic faculties.

SEX SENSE (GENERAL)

: term here given to a form of discrimination concerning the total inhabitation, deriving from the internal 'sex bias' of the individual.
: develops at puberty and covers all action of the maturing individuality (q.v.).
: arises prior to, and so assists the discriminate and discretionate facultisation of the local, external genital faculty.

*vide* Faculty for Genesis

SPACE-TIME*

: conceptual dimension having reference to the negative aspect of the bionomic universe.
: concerns equities (q.v.) and their motion according to the law of probability in a field of Chance.
: facilitates quantitative assessment, comparison and statistical appraisal of equities and their motion; subject to mathematical systems based upon a 'unit'.
: provides for materio-dynamic co-ordinates only; bearing records of Energy, Chance, Probability and (Sequential) System (q.v.), Entropy.
: of negative specificity hence as such could be included in Memory-Will as a special case.

SPECIFIC DIVERSITIES

: configurations which – with their wholes – constitute the content of Memory.
: qualitative entities which, characterised by absolute diversity, have the attribute of uniqueness.
: subject to change of a peculiar nature defined as 'motility' (q.v.) by which the configurations of new specific wholes arise in the content of Memory.
: when subject to change, not obliterated; their specificity being embraced in the new specific whole created; cf. qualitative

differation (q.v.) in Memory-Will; hence the ineffaceability of the content of Memory (cf. the effect of motion on equities in Space-Time).
: evidenced in Space-Time materialisation through the affect of eclectivity on the organic mechanism as seen in action-pattern.
*vide* Memory Co-eclection

SPECIFICITY
: refers to the uniqueness of the contents of Memory in regard to their specific appositeness to each other and to the new wholes they create.
: recognisable in the organic mechanism by the aptness of reaction to allied entities.
*vide* Whole Eutrophy Quality

SPONTANEITY
: the dynamic mode of qualification in a field of unity (q.v.) in Memory-Will; the mode of cosmic creativity.
: neither sequential nor 'causal' in a materio-dynamic sense; and without reference to Time. Referable to 'eternality' as an attribute of Memory-Will.
: not recordable on the materio-dynamic co-ordinates.
: awaiting a mathematic of 'unity' referable to a functional co-ordinate.
*vide* Mutual synthesis Will

SUBJECTIVE SPECIFIC SYNTHESIS
: characterised by the method of use of the content of Memory.
: arises through eclectivity in a field of unity in Memory-Will; affective throughout organism and its inhabitation.
: conspicuously arising in the acceptive mode of attention (q.v.) in the organism.
: contingent upon direction of the directible organic mechanism as orientated by the ethonological whole – in the mutuality of synthesis of organism and environment; and in altruity (q.v.).
: fulfils bionomic needs.
: Contrast with objective specific synthesis: (q.v.).
*vide* Health Function

SYSTEM*
: pertains to the sequential procession and regularities of materio-dynamic operation; e.g. 'motion' in Space-Time.

: governed by law of probability in field of Chance, excluding function of Choice.
: recordable on materio-dynamic co-ordinates alone.
: contrast with bionomic order.

THOUGHT
: qualitative reality in Memory-Will.
: derives from recognition of specific configurations in Memory in their appositeness to specific diverse factors in the living entity.
: so an affect of eclectivity in Memory-Will inducing aesthesia in organism.
: used here with creative connotation only; and not as applicable to any process dissociated from eclectivity; e.g. 'intellectuallity' associated with objective specific synthesis – the automatic use of the Memorial content.

UNITY
: refers to 'field of unity' in which qualities and qualification arise.
: of trinitarian constitution, essentially of two parts and their whole.
: construed as basic integer referable to quality and qualification; hence, as 'unit' is basic integer referable to the assessment of quantity of equite parts and of the All of parts, so 'unity' is the basic integer in the assessment of quality of specific diverse complements and their specific wholes; and of the Whole.
: basic integer of a mathematic as yet to be devised; zero ⇆ infinity in eternality, appropriate to functional action and referable to the functional co-ordinate.

UN-WILLING*
: pertains to the rejection of an eclectic affect of Will.
: implicit in mode of primary focus (q.v.).
: contrast with Willing-Nilling, in which no 'rejection' is implied.

UTILISATION
: crucial factor in functional action.
: 'how' the facultised organism uses 'what' is available in the environment in meeting its functional needs (q.v.).
: points: difference between a (statistical) fact and a functional act.
*vide* Action-pattern Field of Opportunity Choice

VOLUNTATION
: 'acceptance' by the living entity of the spontaneous affect of

eclectivity in Memory-Will; such acceptance accompanied in the organic entity by aesthetic imperience.
: to be distinguished from 'voluntary' action, as in physiology and philosophy.
*vide* Willing-Nilling

WHOLE
: an ethonomous entity constituting a specific configuration in Memory and basic in the study of ethology (health).
: essentially consists of two parts; such parts being of two possible kinds, either (a) diverse but appositely specific parts – the specific diversities (q.v.), or (b) equite parts – the equities (q.v.) of negative specificity.
: actional manifest in a field of unity involving a dynamic deriving from both parts and their whole : within-out, without-in.
: unrecognised in Space-Time of physicist.
*vide* Memory-Will Function Unity Eutropy Emurgy

WILL *Skr. varati = chooses, variety (diversity) cf. OE. wilfully = gladly, (= appetite, aesthesia) cf. Sc. & N. wale = to pick out, make a choice.*
: the cosmic entity to which is attributable the motility (q.v.) of the specific diverse configurations in Memory.
: essentially to be associated with the medium Memory, the two yielding a grid of reference through which quality and the process of qualification, spontaneous in affect throughout the whole, may become accountable. (cf. Space-Time in which quantities and quantification alone have significance).
: manifest in eclectivity (q.v.); *vide* also aesthesia.
: orientative of both parts and whole in autonomous action in field of unity; in Memory-Will; hence the 'direction' of the directable organic mechanism (*vide* Functionary).
: affords frame of reference illuminating the directionality of energy manifestations in the bi-polarity of the cosmic field of unity – energy/emurgy (q.v.).
*vide* Eclectivity Field of Unity Motility Choice

WILLING-NILLING
: referable to Will.
: arises in the mode of attention (q.v.).
: Willing: the acceptance of the eclective affect of Will in respect of that which is apposite to a present need.

: Nilling: the by-passing of memorial content in the inhabitation not apposite to present need, but *without rejection* (*vide* Unwilling).
*vide* Voluntation

YOLK SAC

: embryonic structure functionally related to the aesthetic content (imperience) (q.v.) of the organic mechanism (hypothesis).
: membraneous sac within the ovum containing material chosen by itself as a self selected nutrient store for its growth; in the development of the embryo this content – an 'own-spun' contribution from within the cell – is utilised in mutual synthesis together with a 'home-spun' (congenial) environmental contribution from outside the cell: (cf. the yolk and the white of the egg).
: before the disappearance of the yolk sac in the development of the embryo, portions of its active membrane penetrate the body of the embryo, there forming a membraneous threshold of exchange or internal environment (q.v.): this membrane bearing in the adults bear internal 'features' such as thyroid, pituitary etc. representing internal faculties (q.v.) of the organism.
: the internal environment subtends the aesthetic content of the entity and is to be associated with an aesthetico – directive system (q.v.) analogous to the sensory-motor system associated with the income from the external environment (sensation).
*vide* Internal Environment Aesthetico-Directive System

ZERO: INFINITY

: ciphers in scale of mathematical system based on 'unity'.
: zero pertains to content, of which there is no context; e.g. 'unit' of physics.
: infinity pertains to the context – Whole – of which the All is the content.
*vide* Unity Functional Co-ordinate

ZONE OF MUTUALITY

: site at which mutual subjective synthesis (q.v.) appears.
: hence site in which to look for action-pattern (q.v.) of functional action, or health.

# APPENDIX 1

*Use of the word 'health'* (chapter 1, p. 14)

It would have been preferable throughout this text to have been able to use the word 'health' instead of 'functional existence' and 'functional action' for the process that underlies health. The word 'health' is open to devious interpretations by medical scientist and layman alike. Apart from the tentative and highly technical definition arising out of our own work, it appears to be without technical status as a distinct process in biological science. Wherever no signs of disorder or disease obtrude, a state of health is tacitly assumed to exist. The presumption that that state is shared by all those not demonstrably sick is accepted as the basis for statistical appraisements of health.

The word 'health' is a very old one in the language: *haelph* (A.S.), deriving from the root *hal* from which also derive *whole, hale, holy.* Thus the word bears a deep and wide intuitive meaning yet to find expression in modern terms. Its positive meaning of 'wholeness' remains without definition and has found no application in man's technology.

Meanwhile the rapid progress of the science of pathology has vastly developed the negative aspect of the word; here again, the tacit assumption is that where no disease is discoverable the state of health exists. The inferences from this are two: (a) that health is to be achieved by the fight against disease, and (b) that where cure and/or prevention have been achieved, health will result.

The issue has been further confused by propaganda for the elimination of sickness. To make this more acceptable to the public, it has long been fashionable to call the sickness services 'health services'. The result has been that the word 'health' is now enmeshed in all that has to do with sickness. That the essential meaning of the word – *wholeness* – should be overlaid with splints, bandages, anaesthetics, soporifics, tranquilisers, disinfectants, antibiotics and every sort of preventive measure, would seem not merely a semantic error but a grave disaster for the common weal.

How lost health can be patched and palliated presents a different challenge to the scientist from how health can be cultivated – grown – within the dictates of bionomic Order. These two aspects – pathology and ethology – involve two different scientific adventures.

# APPENDIX 2

*Findings of the Peckham Experiment* (chapter 1, p. 14)

*The Peckham Experiment,* p. 96: Figures derived from first overhaul of the first and second 500 families examined (approximately 1500 individuals in each group excluding infants under 5 years of age), indicate the approximate relative proportion of those to be found in 'health', in 'well-being' (compensative existence) and in 'dis-ease'.[1]

| | *1st 500 families* | *2nd 500 families* |
|---|---|---|
| With disorders inducing dis-ease: | 31·6% | 21·3% |
| With disorders, but without dis-ease ('well-being') | 59·0% | 68·5% |
| Without disorders (? health) | 9·4% | 10·2% |

See also chart – frontispiece – *The Peckham Experiment.*

Some credence was lent to the general applicability of the Peckham findings gathered before 1939 by disclosures in the U.S.A. and in this country arising out of the medical examination of recruits during the war. Nonetheless until recently the Peckham figures have remained unchallenged and unconfirmed by subsequent investigation of any sample of persons of all ages drawn from the general public. During the last decade there have begun to appear the results of detailed survey of persons of certain age groups, e.g. children in schools, groups of adolescents, of personel in industry or of selected groups of society, e.g. underprivileged families. In each case, these have disclosed unsuspected disease and disorder, so supporting the Peckham findings. Recently, in 1961, there appeared in the U.S.A. a survey more parallel to our own in that it embraced a wider age group (approximately 20–79) than most and included an examination practically identical with our own, except for the

[1]'Dis-*ease*' is used here to indicate the subjective state of the sufferer; 'dis-*order*' to indicate an objective pathological state recognisable by the professional diagnostician. 'Well-being' is used to indicate an individual in compensation, where disorders are masked by a 'sense of well-being'.
For analysis of the nature of disorders found, see *Biologists in Search of Material*, pp. 52-3.

additional use of X-Ray examination of the chest and cytological examination for uterine cancer. To quote from the synopsis given of this work: 'A study was made of the health status of persons who considered themselves free from disease. Multiphasic examinations carried out on 10,709 apparently healthy subjects showed that 92% had either organic or functional disease.'[1]

That these figures are so similar to our own is the more striking since apparently the workers in U.S.A. were not conversant with the findings of examination of a specimen of the uncomplaining British public made in this country twenty years earlier.

## APPENDIX 3

*The place of morality* (chapter 1, p. 21)

Some form of morality may perforce be essential; for where ignorance prevails man's action must rest on Belief – in which morality has its basis. But clearly 'morality' must vary inversely with the growth of knowledge; and hence with the translation of Belief into Faith in action. No morality can be invested with permanent stability until it is grounded upon nature's bionomic laws; i.e. the laws that determine the bionomic order of organism and of environment.

In this circumstance, morality essentially imposed from without, gives way to the spontaneous orientation of action from within the Whole.

## APPENDIX 4

*Prevention* (chapter 1, p. 22; chapter xx, p. 239)

In the fight against sickness, prevention is acclaimed as the high road to positive health. But it is one matter to accept prevention as the optimum method of combating disease, and quite another to envisage prevention as the highest accredited proceedure for the cultivation of health.

No preventative measurecan be taken without foreshadowing

[1] Joseph E. Schenthal, M. D. 'Multiphasic Screening of the Well Patient', Jour: Amer: Med: Assn. vol. 172, no. 1, 1960.

the threat of disorder or disease. This holds true whether it is applied to the person, to society or to the nation. Hence, where prevention is adopted the outlook, both of the administrator and of the subject to be protected, must be directed to one or other category of threat.

It is not sufficiently realised that prevention can only arise from the anticipation of consequences and can only avert those consequences by one or other form of safeguard or therapy. As an example, protection from an attack of diptheria is acquired by injection into the subject of diptheria toxin along with antitoxin; it is necessary to give the 'cause' to avoid the (possible) consequences. In the case of protection from smallpox it is even necessary to administer a live virus in attenuated form in order to induce immunity from the more serious consequences of the disease. Both these instances illustrate the fact that the principle of prevention is that of 'anticipatory cure'; that is to say, essentially a therapeutic measure.

But no cure is 'safe'. All leave their scars of repair or reaction to unwholeness in material or dynamic form; these are the 'signs' of cure. Hence, even preventive 'cure' is never lightly to be undertaken; nor to be universally applied. Moreover, all preventive cure – that is to say anticipatory cure – demands perhaps higher technical scientific skill and *ethical* skill, than any other form of cure, for the requirements of prevention have to be balanced delicately in the scale pan with the action of health.

The criticism that as a principle of action prevention must necessarily invoke fear and apprehension in the public, is countered by the contention that once protected, the burden of fear is lifted – and so can be forgotten. That may be so, but it does not alter the fact that man's action is wont to be conditioned by the direction in which he is facing. Moreover, as we shall see later, memorial patterns of specificity remain with us, capable of influencing action – whether we remember or forget them. Unfortunately, once the habit of reaction has been learned, that habit of reaction is apt to replace action appropriate to the living moment.

But these are not the only factors deserving consideration. There is the practical aspect to be faced. The number of consequences that may be feared – and for which science will undoubtedly find protective measures – is well-nigh illimitable (*vide* the number of protective inoculations even now considered desirable for the young child). It is not, then, a question of prevention of any *one* consequence that must be taken into consideration, but that of an

almost continuous stream of preventive measures arising with ever-increasing scientific skill and knowledge. Hence, prevention consistently applied as the chosen method for achieving Health must eventually stifle its own efficiency. The road to Health is not paved with good preventions.

It is difficult to accept the preventive attitude to living as primarily belonging to Health; or its application to the disposition of the healthy. Health – i.e. *living* – is not to be sought or found in the morality of 'safety first' – which is the term the man in the street has given to the principle of Prevention. To be preventively-minded – to fear consequences – in itself undermines the courage to tackle and to eliminate causes.

An alternative might be for the administrator to institute preventive measures unknown to the person or public to be protected. Though any such administrative measure is not beyond conception in the contempory political climate, it would be a measure repugnant to the concept of the liberty of the person. Nevertheless, that such an instance of misplaced administrative zeal might arise, is not to be overlooked.

Science attests to the fact that preventive procedure stems from pathology. Let us look more closely at the scientific findings in this matter, taking for example protection from infectious disease, to which study biological science has much to contribute.

All prevention must be specific; hence the 'causal agent' in each case must be proven before the consequences feared can be prevented by scientific means.

Preventive measures rationally and fruitfully applied are applicable only to the susceptible – in whom alone immunity to any specific threat can be induced. But not all subjects are susceptible.

Susceptibility has its own natural laws; they are those of pathology.

What is not generally appreciated is that there is a natural state of *insusceptibility*. This can be gathered from the following facts.

1. In any epidemic not all subjects succumb to the disease even though they have not previously suffered from that specific, complaint, nor have previously been immunised against it. Neither in all such insusceptible persons are immune bodies – indicative of resistance to a 'causal invasion' – found to be present.

2. Again, though not all have suffered and not all have been immunised, epidemics of specific infection 'fade out' naturally, having failed to claim the insusceptible as victims. Although not generally appreciated, this fact is known to the epidemiologist.

3. A point of general biological significance is that the greatest

hindrance to the pathologist in initially establishing the identity of a specific 'causal agent' has often been the inability to find any experimental animal susceptible to inoculation. Indeed, there have been instances in which it has been necessary to bring about injury to an animal before it will 'take' a disease.

From the above facts it must be deduced that there is the potentiality in organism to come to terms with environmental circumstances which are inimical to the susceptible.

What these other (natural) methods may be is not yet understood – for as yet there has been no scientific study of Health, and so no study of the state of insusceptibility. It is clear then that understanding of insusceptibility cannot properly be reached through the study of susceptibility, since one implies the absence of the other. Insusceptibility does not lie in the field of Pathology. It must be sought in the order and ease of Health, or Ethology.

Reliance on prevention as a general principle inducing immunity to disease may moreover well inhibit in the populace the emergence of natural insusceptibility. Worse than that may follow: experience has demonstrated that immunity from consequences all too easily breeds toleration of 'causes' – a situation not unknown in recent medical and surgical procedure.

It must be understood that no claim is being made here for the rejection of prevention as a rational procedure in any given situation, or that there are *no* circumstances in which its application is rational. But where prevention as an immediate and rational procedure is necessary, its scientific application must be limited to those in society who are susceptible to the specific threat to be countered. Any routine form of mass prevention, far from being a scientific procedure as is claimed, comes dangerously near to superstition.

There are two procedures presented to us by nature as possibilities – the cultivation of Living, and the prevention of Dying. Health and Disease each have their *own* lines of progression. These run parallel – they do not meet and fraternise – for they are *antithetic* one to the other.

There is no need to point out our present choice – the child's exercise book in which I write at the moment has six 'Don'ts' printed large on the back. Every other hoarding carries the premonition of the fear of death – 'death on the roads', 'death from diphtheria', etc. Pity and propiation are the substitutes for Love and Living. It is open to man either to promote in mankind the Love of Living; or to impose the Fear of Dying.

The cure of disease and disorder, whether applied after or before

the consequences arise, and whether applied to the individual or to society, must be kept to its own appropriate province. Like the 'poor' (as the Master Ethologist said) the susceptible are always with us – they will always need care and attention. It would, however, be deplorable if at this juncture in civilisation the medical profession should be the means of reimposing upon the people a morality of fear and superstition by elevating prevention to the position of a general principle governing action in the field of Health.

In this connection it must be recognised that there has of late arisen a confusion, both in the field of medicine and in that of politics, between 'mass' and 'social'. 'Mass' is perhaps the least social congregation that it is possible to imagine. Nevertheless this confusion appears to beset the conception of preventive and of social medicine which finds its expression in mass therapy of many kinds: mass milk for the school child, mass radiography, mass prophylaxis, mass fluoridisation of water, etc. The same trends are all too flagrant in modern politics. In contemporary society the confusion of mass with society bedevils both.

## APPENDIX 5

*Ethology* (chapter 1, p. 22)

The terms 'ethology', 'ethos', 'ethics' . . . have been for so long the perquisite of the humanistic philosopher that it is difficult – perhaps rash – to attempt definition of any one of them in terms of the natural philosopher or scientist. No positive definition is possible until the nature of health id defined. For the time being for both aspects of philosophy, whether logical or natural, 'ethology' could be regarded as study of that state of order and ease forming the background against which disorder and disease become manifest in organism.

Recently there has arisen a school of biologists properly concerned with study of the behaviour of the organism in its environment to which the name Ethology has been given. In this use of the term there is, however, no indication of any distinction to be made between the several processes underlying the behaviour of the organism. Ethology in that context is not precisely confined to the behaviour of the ease and order of health as distinct from the action-pattern of any other form of behaviour. As examples there may be included behaviour

due to compensation, either for disguised disorders, or due to experimental limitation of the environment.

From the point of view of medical science, more exact definition is required.

## APPENDIX 6

*The 'normal'* (chapter II, p. 31)

The 'normal' is a term accepted and used by the physiologist, pathologist, clinician, sociologist and statistician, as well as by the politician and the public. Technically the 'normal' might be defined as that personal or social entity which manifests no symptoms of disease; i.e. the uncomplaining person, or public. While such an entity may be of significance to the politician, it is readily appreciable that it can have no relevance in the assessment of health. It appears, however, that it has not even relevance to the incidence of sickness. for we now see clearly that diagnosable physiological disorder and/or clinical abnormality can exist as symptomless conditions. Our own studies were perhaps the first to show the relative extent of symptomless disorder in a specimen of the public chosen as likely to manifest a relatively high degree of health. But it is not necessary to fall back on our figures to demonstrate the equivocality of the 'normal' as a standard on which any reliability can be placed.

## APPENDIX 7

*Biological order* (chapter III, p. 33)

It has been usual in general biology to treat with order largely in terms of structure rather than as a factor underlying all functional action. Modern embryology and tissue culture studies essentially lead to the conception of 'order' as a characteristic of growth and development. That that order is manifested in and effected by the materio-dynamic sequences of the organic mechanism is obvious. That still leaves unsolved the question of the origin of the 'ordering.'

# APPENDIX 8

*The judgment of quality* (chapter III, p. 37)

Looking through the history of materio-dynamic achievement, we shall find that the judgment of quality – the foundation of art[1] – has frequently preceded the discrimination of quantity – the foundation of materio-dynamic science. Newton began his studies of 'light' by recognition of the quality 'red', 'yellow', 'indigo', etc. Those studies have issued in the present position in which, colour disregarded, 'light' is identifiable and accurately measurable in wave-lengths, or quanta; i.e. purely objectively. By the process of scientific experiment the natural laws governing the materio-dynamic quantitation of 'light' have been elucidated, thus making possible the exact manipulation of that form of energy which Newton was interested in and first approached subjectively as 'colour'.

Now that this has been done, the subjectivity of colour – 'red', 'redness' – comes to stand out the more clearly as a distinct entity: a 'quality' of biological significance as yet without defined meaning in science.

It is vividity of consciousness that characterises the artist and gives him a sense of action-pattern, the evidence of quality to be expressed by him in stone, pigment or other medium. It may well be that it is the same vividness of consciousness that leads the scientist, through growth and differentiation of the mind, to his life-work of adaptation to new patterns perceived. To the biologist such a process might well appear as not unlike that by which the embryonic mass proceeds by growth and differentiation to fit itself into the new action-pattern of the specific environment into which it will emerge. However that may be, it should not disturb the conscience of the scientist in beginning a study of living, to look at 'quality' – which belongs to the organism as a whole in the totality of its environmental inhabitation – as a 'something' as yet undefined which is distinct from what is to be seen from the study of organism in isolation, or from study of material drawn from the organic entity; e.g. as in biophysics, biochemistry.

[1] see e.g. *Icon and Idea,* Herbert Read. Faber and Faber, 1955.

## APPENDIX 9

*Synthesis in the cosmic organism* (chapter v, p. 47)

Evolution as seen from the aspect of quality or function is no mere record of the ancestry of man (or other species), but the manifestation of a *power* (synthesis) cosmic in scope evidenced in the 'processing' of growth and differentiation in the cosmic organism.

In the cosmic organism it would seem probable that its responsiveness is 'facultised' at the immediate acme of growth and differentiation: spontaneously by creation in the realm of quality wherein evolution is a process – not a history. So, ecology could be seen as the study of what might be called the 'finger-prints' of the cosmic organism, showing that its structure bears its seasonal marks as surely as the trunk of the tree.

It is not, however, the items – the 'finger-prints' – but the element of specificity that induces them, which must ultimately engage the attention of the ecologist. Beyond historical survey there lies enquiry into the qualitative relationships inherent in that specificity.

## APPENDIX 10

'*Purpose*' *and bionomic order* (chapter v, p. 48)

In the all-pervading specific diversification of growth and differentiation we might conceive a stupendous 'purpose': and – had purpose any significance at all beyond the field of human passions – here then, indeed, would be 'purpose'. Purpose in that case would mean no more than man's emotional recognition of the subjectivity of cosmic synthesis. But we must warn the observer again not to drop the bioscope from his eye and seek explanations. For if synthesis implies 'design', 'design' is caught up in common understanding with voluntary intention and objectivity and so, without the bioscope, he would be back again in teleological obscurantism.

## APPENDIX 11

*Mutual synthesis in experimental conditions* (chapter v, p. 61)

In how far the faculty for mutual synthesis will be found to act in extenso where combinations of organic material (e.g. transplants of ova, A.I. etc.) are brought about objectively, yet remains to be seen. In consideration of the physiological reserves held in organic material, evidence of the working of this primary faculty may not cease until these physiological reserves have been exhausted – say a generation or two. Or again, being a faculty working in mutual synthesis with the environment, its facultisation may progressively 'fade' as the environment of implantation becomes progressively 'unfamiliar', i.e. progressively non-specific. This might be a nice matter for experiment.

## APPENDIX 12

*The brain – a 'battery'* (chapter vi, p. 73)

. . . as though the brain were the 'battery' of the vehicle, in which there are two closed circuits – the blood circulation dealing with the chemical content and the 'neural circulation' dealing with the dynamic content. Biology still awaits its Harvey to demonstrate this dynamic 'circuit'.

## APPENDIX 13

*The protean nature of the 'patient'* (chapter vi, p. 74)

The individual – hence also the doctor's 'patient' – is a qualitative person with a quantitative organic mechanism, or tool at his disposal. He may either use, or dispense with his qualitative attributes and this he can do by determining how he will use his organic mechanism. How it is used will govern the output of that mechanism. Moreover,

how he uses the mechanism at his disposal is no consistent factor in his behaviour. One day he may be directing his mechanism according to the qualitative possibilities of himself and his environment; another day he may 'set' his machine to work on a given course – much as a pilot can turn over the direction of his plane to 'George' by employment of an automatic gadget; or, in retiral from command, the organic mechanism can run itself on the basis of purely quantitative reactions. Any combinations of these possibilities open to the 'patient' may occur – and at different levels of physiological action at any one time. The complications of the situation with which the clinician is faced are variable indeed.

## APPENDIX 14

*Concerning the intimate structure and physiology of an organ of the aesthetico – directive system* (chapter VIII, p. 95)

When considering the possibility of organs subtending an internal environmental threshold associated with the feelings, or aesthesia, we must here recall certain facts disclosed by us in researches into the histology of the thyroid gland and into paths taken by its essential secretion as it leaves that organ.

Close study of the histology of the thyroid disclosed it as formed of columns of naked epithelial cells – or rather columns of syncytia – enclosed within a *lymph-sinusoid*.[1] Throughout the length of each coiled column of syncytium and peripheral to its nuclei, there is suspended a net-work structure of 'microcapillaries'.[2] When the gland is quiescent, i.e. when its secretion (as distinct from colloid) is not flowing, the strands of the net-work appear to contract in girth, so giving to the net-work the appearance of a fine 'hair-net'. When the lumen of this quiescent gland is distended with colloid the syncytioplasm is flattened out at the periphery and the microcapillary net-work is then easily mistaken for cell-membranes. When, however, the gland is actively secreting – a condition emphasised in untreated hyperthyroidism (no longer commonly to be seen by the pathologist), first the syncytial nuclei become heavily

[1] 'Structure of the Thyroid Organ in Man,' Scott Williamson & Pearse *Jour. Path. & Bact.* vol. XXVI (1923).

[2] 'A System of Microcapillaries in the Thyroid Gland', Scott Williamson & Pearse. *Jour. Anat.* vol. LVII, p. 193 (1923).

laden with course granular material; this material is then discharged from the nuclei into the syncytioplasm. From the syncytioplasm the course granules pass into the microcapillary net-work which consequently takes on the appearance of 'tubules' swollen and beaded with the coarse granules, the syncytioplasm the while becoming void of granular content. Subsequently this same granular material can be seen in heavily laden exits leading in a radial direction from the microcapillary network to cells of the reticulo-endothelium lining the lymph sinusoid.[1]

At the time this work was done, the then current view of the histological anatomy and physiology of the thyroid made it difficult to accept evidence which pointed to so different and unusual a structural actuality. The correctness of this unfamiliar picture of a lymph-sinusoid as the essential basic functional unit of the thyroid gland was, however, to be further supported by phylogenetic evidence. In the fish, *lophius piscatorius,* the thyroid gland was found to consist of relatively short single, unconvoluted colums of thyroid syncytium attached, each by a single stalk, to the wall of a relatively large lymph sac in the neck of the fish.[2]

We refer to these findings not merely because of the peculiar histo-morphology of one of the important endocrine glands presenting at the internal environmental threshold, i.e. part of the aesthetico-directive system we are here concerned with, but more particularly because of two features noted in the distribution of the secretory products (other than colloid) from the thyroid lymph-sinusoids.

The first point is the appearance of granular secretory material passing from the secreting thyroid gland to the reticulo-endothelial cells of the lymph-sinusoids, and subsequently to the lymph channels associated with them. Modern work demonstrates that specific substances – particularly those connected with immunity – are intimately connected with the cells of the reticulo-endothelium.[3] It may prove significant that the 'own-spun' content of a gland associated with the aesthetico-directive system and originating embryologically from the fore-gut derived from that portion of the yolk sac membranes which penetrated the early embryo, should be found to take the same course.

[1] 'A Reticle of Endothelial Cells in the Thyroid and Parathyroid', Scott Williamson & Pearse. *Jour. Path. & Bact.* vol. XXIX, p. 167 (1926).

[2] 'Anatomy of the Special Thyroid Lymph System', Scott Williamson & Pearse. *Brit. Jour. Surgery.* vol. XVII no. 67, p. 538 (1930); R. H. Burne, *Phil. Trans. Roy. Soc. Lond.* series BCCXV, I. (1926).

[3] e.g. *Enzyme, Antigen & Virus,* Sir F. MacFarlane Burnet. C.U.P. (1956).

The second feature of significance is the fact that the granules of secretory material (not colloid) from the thyroid, after their passage into the lymph-sinusoids, can be followed into the parathyroid bodies, there being brought into direct association with the prominent nerve cells of that organ.[1] For this reason we termed the parathyroid a 'neurotrodal' gland or 'taster' organ taking cognisance of the qualitative transactions at the internal environmental threshold and in that way bringing that threshold into direct linkage with an autonomic nervous circuit: (cf. the pre and post trematic nerves in the embryo). Thus the thyroid apparatus deriving from the fore-gut (yolk sac derivative) is connected with the brain.

In this way the thyroid, an essential organ arising from the yolk sac, would appear to yield evidence in support of the presence of an aesthetico directive system associated with the internal environment threshold. An analogy with the sensory-motor system with its associated organs developed from the external integument – the external environmental surface-threshold of the adult body—could thereby be sustained.

Note. The microcapillary system of structures are present in other organs arising from the yolk sac derivatives: e.g. anterior pituitary, liver, bile ducts;[2] also in the vagina and probably in the gut. It is possible that further research might disclose this structure as peculiar to the inclusions of the yolk sac membrane in the adult body.

## APPENDIX 15

*The influence of genetics on eugenics* (chapter x, p. 107)

The brilliance of the geneticist's work has for too long turned the eugenist along the same path, in spite of the fact that in respect of human society, there is relatively little that – without compulsion – can be done through control of the genes to further health; and not a great deal to avoid disease. The preoccupation with genetics alone as the method of choice for improving human material, has diverted

[1] 'Applied Anatomy and Physiology of the Thyroid Apparatus', Scott Williamson. Arris & Gale Lecture. 1926. *Brit. Jour. Surgery*. vol. XIII, no. 51, p. 479.

[2] 'The System of Microcapillaries in the Liver & Bile Ducts', Scott Williamson & Pearse. *Jour. Path. & Bact.* vol. XXVII, pp. 319-21 (1924).

attention from the cultivation of man's nurtural inheritance by which genetic potentialities may be activated. This becomes the more pertinent the further knowledge of genetics is pursued and the possibilities of the permutation, combinations and persistence of the genetic elements is realised.

Human existence determined merely by logic and precaution directed to the manipulation of the genetic inheritance alone, can never equate with man's living in biological wholeness.

## APPENDIX 16

*Bi-sexuality of the body cells* (chapter x, p. 116)

It is indeed likely that it is the inherent bi-sexuality of each cell that makes tissue-culture a possibility. That, given the minimal environmental circumstances, a tissue should grow and develop is to be expected. Any cell in the body, if forced by circumstances to assert its instinct for survival, can develop independently of its 'whole' and so become a cancerous cell – in defiance as it were, of its pathological circumstances. The change is in the *circumstances*, not in the cell which continues to obey the laws of evolutional energy in propagating itself as a 'person'. This it continues to be able to do – owing to its fundamental basic nature as a bi-sexual entity.

It has recently been put forward that the same bi-sexuality of the somatic cell plays an essential part in the sustenance of an acquired immunity once that has been initiated in the entity by a suitable antigen.[1]

## APPENDIX 17

*Grounds for divorce* (chapter x, p, 132)

If, like the novelist, we dare to look at things to come, we would postulate that the 'grounds' for divorce will be that the partners are anaphylactically related: that as tested by their secretory effects on one another they are pathological counterparts, not physiological

[1] see *The Clonal Selection Theory of Acquired Immunity*, MacFarlane Burnet. C.U.P. (1959).

apposites. Applicants for divorce of this order might, of course, be 'treated' just as the asthmatic is treated. But the results cannot be said to be satisfactory, as the basis for reaction is not readily eradicated. Such pathological counterparts in partnership being able only to react in lysis could rationally be regarded as not – in fact – 'mated'. In other words, they are mutually 'impotent' to act in the bionomic mutuality of synthesis: i.e. in 'love'.

This, however, would imply a deeper qualitative comprehension of the bionomic issues involved than is at present in currency. It does, of course, imply a deeper understanding of the meaning of marriage that that of the carnal or physiological basis on which its regulation is at present grounded in civilised societies. It may well be that the 'spiritual' aspect that intuitive wisdom has long attributed to the estate of marriage will ultimately prove to be grounded in bionomic regularities as yet not disclosed.

## APPENDIX 18

*Egocentricity – operation in a field of unipolarity* (chapter x, p. 138)

Egocentricity – egotism – is a symptom of disordered 'individuality' which traverses the ethonometric field subject to the natural urge for unity. But egotism operates in a field of unipolarity, i.e. about its own centre rather than in a bi-polar field of unity. Thus unable to embrace in mutuality of synthesis because of disorder, it therefore rapes that which it cannot marry.

## APPENDIX 19

*Difference between 'free' and 'loose' parts* (chapter xii, p. 146)

The difference between 'free' and 'loose' is not well appreciated these days. Authority everywhere confirms the confusion between them by treating any 'free' wheels in society as 'loose' wheels. Until some fundamental principle pertaining to the nature of autonomous action stated in modern terms emerges, this must go on. Youth is perennially in revolt against the conditioning of reflexes used as a mass therapeutic measure for the control of 'loose' wheels.

An understanding of the bionomic functional significance of autonomy by the administrator would thus seem to be an urgent necessity in the 'modern crisis' in social affairs. Automony might turn out to be the principle underlying that which is true in the 'ideal' of liberalism.

## APPENDIX 20

*Mind and mechanism* (chapter XII, p. 149)

Biology has not escaped the expectation of 'prophecy', *vide* the revival of its promise in the investigation of cybernetics as an explanation, not merely of cerebral operation, but of what is commonly conceived as cerebral mechanism.

## APPENDIX 21

*Autonomic action* (chapter XII, p. 153)

Varying degrees of contempt are apt to be meted out to any 'involuntary' action. That may be why the physiologist coined the word 'autonomic' – meaning action motivated from self-contained order (or 'knowledge').

It should be fully understood that in this text we are using 'autonomic' as referable to the conditions we discern as attached to that principle of action – autonomy – whereby the mechanism, any mechanism, may acquire directivity. These conditions, while comfortably embracing the attributes of all operation designated as 'autonomic' by the physiologist, go considerably beyond them, having application in a wider field of bionomic action.

It is, for instance, to the exquisite wisdom of this autonomic sensibility of the functionary that the embryo owes its delivery from the functionary's workshop, the womb, in a high state of mechanical perfection; and it is to this fount of wisdom, far transcending all 'voluntary' wisdom, that the sick rush after having shed most of their faculties to which are assigned 'volition'.

## APPENDIX 22

*Growth as endocrine differentiation* (chapter XII, p. 153)

It is the ethonometric field of autonomic function which exhibits and directs growth autonomically. Thus growth could well be described as endocrine differentiation: that is to say, differentiation of the contained specificities from within the entity. It is almost as though differentiation were the result of a specific 'secretion'. And, since every secretion has its incretive and excretive moiety balanced across an interfascial membrane, the 'endocrine' moiety of incretive synthesis of sensibility would have its excretive results; viz, the facultised sensibilities.

## APPENDIX 23

*The meaning of words deriving from ancient roots* (chapter XV, p. 167)

The meaning of the ancient and basic words of man's language begins as embryonal, foetal; hence they carry with them a vast potential of meaning not yet manifest. It is the 'ideational' – not the technical – meaning that has to grow ab initio in this way. It is better that their meaning should grow and be processional rather than that it should get stuck in the 'fish' stage of ontogeny.

In the unfolding of meaning, each differentiation has to emerge as a subjective synthesis incorporating the parentage from which it springs. So the ancient root, pregnant with meaning, is enriched without danger of restriction of its futural potentiality.

While such synthesis of meaning is in process and the new look is as yet indeterminate, man's communications are forced into analogy. One of the greatest difficulties in learning is the ever present desire to homologise analogies. Unfortunately any effort to synthesise from analogy is necessarily an objective rather than a subjective and creative synthesis, for the operator has nothing to build with but that which is pulled down: old bricks – even if cleaned of their cement. Whereas in subjective synthesis all the bricks are made as

we go along, drawn from the storehouse of mutuality which extends far beyond the meagre cupboard of our own recollections.

It is in the subjective synthesis of new meaning that 'intuition' acts willy-nilly, forcing speech for which there are no words and no language. So inevitably analogy comes into requisition. But then it must be recognised for what it is – the experience of our forefathers of what is to come forth; the group-specific meaning to which the new meaning to be born is but related: not its own meaning, but one to be superceded as the light of a new day dawns.

It was with the foregoing in mind that we chose the word 'memory'– and later the word 'will' – to embrace the content of the communication we have to make in this treatise. Memory, from memoria, yes; but also connected with the root *mer* and associated with the Sanskrit, *smer*, *smar*, to remember; and to love. The pertinence of more remote and distant ideation will become apparent as we proceed and find that the content of Memory grows eclectively by the avidity of one apposite specific pattern to another.

## APPENDIX 24

*Brain – a mechanism for 'remembering'* chapter xv, p. 168)

The fact that the mechanism for remembering is present in the brain modern researches have demonstrated. But how certain remembrances acquire specific potency for the individual who 'remembers' remains unexplained.

## APPENDIX 25

*Memory in facultisation* (chapter xv, p. 170)

There would appear to be no need nor any justification for the Freudian assumption that the infant is born a bundle of dirty and anti-social instincts which have to be corrected to render it socially acceptable. Still less that it is born a prey to atavistic sexual impulses calling for expression. It is born with the tools for action: and these are sharp. For them to become pertinent to him and to society his progressive use of them has to be memorially related to that own individual's specifically patterned environment–through facultisation.

In the evolution of the higher species this potentiality has become expressed and intensified, in the development of myriads of functional foci – nests, holts, sets, lairs, burrows, families in their homes. In natural circumstances these zones of mutuality are 'finger-printed' with individual-specific pattern. Each of these qualitative foci presents the young, born of it and within it, with specifically patterned attributes for synthesis apposite and allied to his own memorial content. Hence from this focus of qualitative import, his facultisation can proceed in the maximum qualitative precision.

That the family in its home may be subject to pathological disorder both in its memorial and material content, is not denied; more particularly in the human species. Hence surgical dismemberment of the family may appear to be the remedy. It must, however, always be kept in mind that surgical ablation is a measure dictated by lack of knowledge of how to reconvert a pathological process into a functional one. Or, still more pertinent, how from the beginning to sustain those circumstances in which functional action may find expression.

## APPENDIX 26

*Consciousness* (chapter XV, p. 172)

It is more than likely that all species are 'conscious' at the apex of the development of their own facultisation, so that 'consciousness' is not limited to the human species as is frequently presumed.

To take an example of the levels of consciousness. The inured bachelor, or spinster is not 'conscious' of the implications of the married state; nor the childless woman or wife, of motherhood – though they may have a penetrating intellectual and/or sentimental appreciation of that which has no qualitative actuality for themselves. Taking this position, 'consciousness' would imply an awareness of the wholeness of the individual's own situation as distinct from whatever degree of discriminate analytical comprehension he may have of the several elements in that situation.

## APPENDIX 27

*The 'real' and the 'material'* (chapter XV, p. 177)

That is not to say that no co-ordination exists between the 'real' and the 'material': merely that at present science is far from being able to make any such co-ordination.

## APPENDIX 28

*Derivation of the word 'will'* (chapter XVI, p. 183)

See Appendix 23: *The meaning of words deriving from ancient roots.*

Weekley: A.S. *willan* (v) *Wille* (n.) = pleasure.
L. *velle* = to wish.
Sanscrit: vr. = to choose.

'The hye God on whom that we bileeve
In wilful poverte chees to lyve his lyf.'
*Chaucer*

S.O.E.D. O.E. *willa* = desire, wish, longing, inclination (to do something).
Sk. *várati* = chooses.

## APPENDIX 29

*Dis-ease in Will* (chapter XVI, p. 188)

Disease is well-recognised by the physician as characterised by withdrawal of an individual from his situation, whether in work, in social life or in the home. The symptoms of this retreat arise in the patient in the guise of psychosomatic disease and neurosis in its many forms. By the physician this is of course not – as here – associated with the stay of motility in Memory-Will. But there has hitherto

been no 'place' to which subjective symptoms could be assigned with any clear and accepted definition. Use of the concept of Memory and of Will as dimensions may possibly offer a better position from which to sort out the processes involved in various pathological states.

Long before clinical disease ensues, the falling away from functional action associated with change in the individual's relations in Memory and Will may be declared in the action-pattern of that individual, being observable in the circumstances of his ordinary life. This change in action-pattern may arise either from rejection of eclectivity, or from incompetence to accept the eclectic flow – the by-passing of Will. So in face of a challenge to action, the 'will' to act may be absent. Or there may also be inadequacies in the individual's facultisation, i.e. in his capability to use either the memorial or the material circumstances that avail him for action; or, a fault in his body mechanism may be prohibiting the co-ordination of events in Memory and Will with materio-dynamic sequences in the organic mechanism.

So the pathology underlying disease may lie in the individual's relation in Memory, or in Will, or in his co-ordination of either or both with Space-Time factors; or it may lie in the Space-Time factors constituting his bodily mechanism; or in all these factors together. But in no case is the potency of the organism's inherence in Memory and Will to be disregarded. In this space age, we are becoming aware of the fact that serious disorder, if not death, can result from immotility in Memory: that is, in isolation from Will. The condition – a retreat from will to live – is better recognised in the East than in Western civilisation; though its aetiology, of course, is not there stated in the terms set out here.

## APPENDIX 30

*Eternality* (chapter XVII, p. 195)

As spontaneity (owing to difficulties of analogical ideation) gets confused with Time, so does Eternality – another qualitative factor – become confused with Continuity; and so does 'origin' get confused with the discontinuity which we are wont to attribute to Placeidity.

As Eternality (ineffaceability) is to Memory;
So Spontaneity is to Will.

As Continuity is to Time;
So Place-idity is to Space.

You can only 'know' (i.e. factorially) Continuity by inhabiting it momentarily so as to see. This is one of our limitations in Space-Time – *vide* slow motion pictures.

## APPENDIX 31

### '*Natural law*' *and the dimension Memory-Will* (chapter XVII, p. 197)

In approaching the investigation of Memory-Will as a dimension, there are necessary reservations to be made.

The recognition of regularities pertaining to 'natural law' in the physical world ultimately relates to the statistical appraisement of the unit-contents of the dimension, Space-Time; i.e. regularities relating to equities that are comparable. In the dimension Memory-Will the outstanding attribute is the absolute uniqueness of its contentual unities. Any reference to 'natural law' as understood in the Space-Time dimension might then carry with it an equivocal implication. No appraisement deriving from mass evaluations can have significance in Memory-Will.

Then there is the difficult question of procedure. Should the scientist pursue the same discipline in approaching the study of aesthesia and of choice as he has so successfully done in the study of physics in the field of chance? Clearly, for instance, he cannot use the method of 'controls' so essential for experiment in physical science. Still more important, is he as resolutely to eschew the evidence of the 'senses' as he eschewed the 'feelings' in his earlier investigation of the 'senses'? That would seem a practical impossibility. It would shatter the wholeness in which quality lies, thus prohibiting the spontaneous emergence of aesthesia for the evidences of which he is in search. On a still more general level, if Choice is the positive (anodal) expression of a negative (cathodal) Chance, then the positive cannot be approached from the negative. Thus an approach through the methodology of physical science alone cannot suffice.

The requisite and new discipline is one that will embrace both quantity and quality; both senses and feelings. Any experimenter exploring the realm of quality must go forward armed with full knowledge of *what* can be done as he seeks to discover *how* that is

done in nature. Each process will have its own regularities; each dimension its own and different aspects of 'natural law'.

It is an unknown field which lies before us. Though the technologist may ignore it, to the scientist – explorer of the unknown – it constitutes a major challenge. He may proceed consistently, like T. H. Huxley, the agnostic, recognising the 'unknown' as something *not* to be ignored. The meaning of 'ignorance' is commonly misread as implying 'not knowing'. But clearly it is not possible 'to ignore' till you *know* that there is something to be ignored. Those who do not know are but as little children – the innocent.

It is perhaps in this connection that an explanation can be found for the scientist's present dilemma. He has forgotten – or ignored – his own faith in nature. From too intensive use of a discipline which has put aesthesia and aesthetics to one side, he has missed the synthesis arising from the mutual mutation of sensation/aesthesia yielding the 'vision' in which alone lies the *meaning for living*.

## APPENDIX 32

*Use of the term 'aesthesia'* (chapter XVIII, p. 200)

Derives from the Greek, but at that time no distinction was made between 'feelings' and 'senses'. The term 'Aesthetics' is now in common use for a field of appreciation which, though ill-defined and subject to continuous shifts, largely covers the field of intuitive apprehension of any object or situation. Here we are attempting to define the source of the 'intuitive': to indicate the site of the materio-dynamic materialisation of the 'feelings' in the organic body, and the part they play in the functional process of all facultisation. Hence the necessity has arisen for some term to cover in general this field which has remained as yet without specific definition.

## APPENDIX 33

*The 'past'* (chapter XVIII, p. 204)

Our recognition of, and the meaning of events in the Space-Time

dimension depends upon the content of Memory. But the content of Memory has the attributes of 'eternality', hence there can be no 'past'. Its content, ineffaceable, is always with us.

## APPENDIX 34

*Needs and wants* (chapter xx, p. 240)

Confusion commonly exists in this field because no distinction has so far been made between what in this text are called 'wants', and 'needs'. Thus in the train of thought brought about by the psychopathologist in the last half century, it has been tacitly assumed that 'cure' lies in the satisfaction of either – wants, or needs. In this lack of definition of the two, it would appear that there are to be found some of the anomalies – and often of disasters – in this field.

## APPENDIX 35

*Sterility or creativity?* (chapter xx, p. 242)

If, accepting man as the predominant species in the living world, we look at these different methods of action in general terms, it would seem that according to the degree of his engagement in qualificatory process – *how* he acts – two possibilities lie before him: either sterility, through repetition and proliferation; or the fertility of creation. Man alone as a species seems to be so constituted that he can 'choose' which.

## APPENDIX 36

*Capacity the root of capability* (chapter vi, p. 70; chapter xxi, p. 249)

Learning 'how' to do what can be done is spoken of in physiological terms as having to 'co-ordinate' – with an underlying suggestion that the 'paths' of transmission have yet to be laid down.

Whereas, the pathways are there – open to receive any communi-

cation that is offered. It is the *nature* of the communication – and its 'utilisation' – that has to be learned.

The bone structure is there all ready to be used; *how* you use the bones will determine the patterns of strain and stress in their adult setting.

## APPENDIX 37

*The democrat* (chapter XXII, p. 251)

This delineation of individuality has its repercussions on society. The sociological 'unit' – the democrat – is a (mechanical) power-unit of the materio-dynamics of society. It belongs to the field of 'relativity' (or dialectics) and has therefore no 'locus' values, no idiom. Hence it is a sociological 'unit' pre-eminently capable of universal standardisation and universal application, but strictly within its own field: e.g. a pound of democrat or an erg of democrat is a universal. In this respect the democrat is just as far from sanity as is the doctor's 'patient' – for both lack the ethonometric characteristics of 'individuality'. A commonality is other than a community.

Hence a sociologist whose material is statistical units must clearly be distinguished from an ethologist – whose basis for investigation is unity and whose material is co(mm)unity.

## APPENDIX 38

. . . *But two parts to any whole* (chapter XXII, p. 260)

In the bionomic world where new qualities arise from the apposition of specific diversities, there are in fact *no more* than two parts to any whole. One specific diversity – itself constituting a specific whole – coming into eclective apposition with another specific diversity – also a 'nucleus' or 'centre' of its own whole – together create a *new* specific whole. In the process of synthesis the parts have changed in quality, giving the new whole specific identity.

To appreciate this we must go back to consideration of the process of mutual subjective synthesis where fields of unity first came to

notice and were found to create wholes upon wholes – of quality (Chapter V).

There we saw that there are as many functional habitations as there are cells in the body of inhabitation; each cell itself an individuality, its content representing a specific 'nucleus' of its own whole, its context being constituted by the specific environmental body of its inhabitation. Qualitatively, there are then as many 'individualities', i.e. specific wholes, as there are cells in the body. Wholes upon wholes.

We saw this to be the case in the ethonological whole, the family, where each individual member is a nucleus of that family as a whole. The family, truly seen by the boy, John, as a whole he can appreciate, is – and is seen by him as – a different individuality, or ethonological whole, from that of which his father is sensible. These are not merely theoretical postulates: they are qualitative factors and ones upon which *action* is based: John's action; father's action.

Functional action proceeds from the 'core' or nucleus of each several whole in an awareness, conscious or not, of its body of inhabitation, also a whole. Only two parts are intrinsically privy to such action: each cell and the body of its inhabitation; each several member of the family and the family as a whole. To each such whole there are but two qualitative parts.

## APPENDIX 39

*Are there 'wholes' in physical science?* (chapter XXII, p. 267)

It would seem possible that it is an undisclosed 'wholeness' that may be involved in the case of the 'jumping' electron, or still more possible in the strange and at present unelucidated behaviour of neutrinos fast and slow, with the hint of a mutuality somewhere in their behaviour. Or again, in the seeming necessity of viewing physical phenomena like light in one situation as 'waves' and in another situation as 'corpuscles'

It is always worrying that it is open to the scientist examining 'facts' to describe everything by two explanations. Either he is seeing the picture as the 'operator' in the projection room sees it, as a million 'stills', or he sees it as the audience sees it, as a continuity. There is the saying – 'You can't have it both ways' – which is, of course, wrong. Every binocular 'vision' is a synthesis of two aspects

seen from two eyes at the same time, but from two different places. Although when we look at anything closely, analytically, we never 'see' it as a whole, we do 'visualise' it as a whole or synthesis of two views. But antithesis, though abhorrent in the process of analysis, is, of course, essential to all biological synthesis.

## APPENDIX 40

*Unity* (chapter XXII, p. 268)

There never was, and never will be, a 'One', but only a 'Whole'. The trinary nature of unity is the key to the lock of eternity. This would seem to have been of man's intuitive knowledge down the ages; though not yet facultised.

> 'Unity produces Duality.
> Duality produced Trinity,
> and Trinity produced all existing objects.
> These myriad objects leave darkness behind
> them and embrace light, being harmonised
> by contact with the Vital Force.' (i.e. 'Will')
> from *Sayings of Lao Tzu*
> Trans. Lionel Giles; John Murray, 1905

Having a basis in unity in the qualitative medium Memory-Will, the totality of functional process is trinary or trinitarian, thus rendering it outside the existing methods of mathematical treatment.

## APPENDIX 41

*The 'originality' of order* (chapter XXII, p. 272)

Patterned order is 'original'; thus the presumption of chance as pertaining to Memory-Will would imply the mis-use of origination; for inconsequentiality – a negative – pertains to Space-Time. Pure mathematics are of quality; solely of Memory unsullied by re-collections and rememberings of quantity. Pure mathematics transcends mysticism, philosophy and science; yet it must tincture, colour, all of them.

The mathematician dealing with quantities picks out of patterned order bits that co-ordinate with sequential system. In thus using inconsequentiality it is inferred that patterned order is not of quality.

There is no need to point out that in a spatially and temporarily linked system, Memory is utterly superfluous. The appearance of Halley's comet was not out of Memory, nor patterned order; it was out of sequential system. We must not mistake the 'inevitabilities' contained in a system of sequences, for Memory. The materio-dynamic cosmology needs no Memory. It has an inevitable sequential system (lesser or greater according to the arc of sequence) in the spacio-temporal medium and is subject to what is called 'cause and effect'; or, when the 'cause' gets lost then 'chance' replaces the lost end.

Things, situations and events can be *repeated* in Space-Time continuum – but not in eternality. From the first subdivision, at no level of *quality* can you find 'identicals'. You cannot add, subtract or divide and then by reversing the process arrive at the thing you set out with; arrive with an original.

To 'qualificate' the universe is something perhaps not attainable except in action – or in the purity of pure mathematics.

# Appreciations

In the tenor of this text it will have appeared that benefits bestowed and received in mutuality are beyond thanks; they bring their own satisfaction – spontaneously. Yet perhaps it is their very spontaneity that claims for them wider recognition.

I have chosen to record here rather than at the beginning, the help so generously given in the preparation of this book, for only at the end will any reader be in a position to assess its value.

First to Mary Langman, formerly private secretary to my husband throughout the strenuous years of running the Peckham Experiment. She it was who typed and retyped so many of the early mss I have drawn upon. Throughout the preparation of the book her integrity and astute critical faculty have time and again safeguarded the meaning of passages often difficult of interpretation. Second to Allan Pepper whose unstinted time and penetrating thought have been given to the reading and rereading of the mss so assuring that the meaning and weight of its chapters should as far as possible be gathered into a unified whole. Last to Douglas Trotter, sometime member of the staff at Peckham, who during that period spent many long mornings discussing with my husband the import of Memory-Will and who, bringing his own intuitive understanding of the subject, has equally with me shared in the preparation of the Dictionary of Quality and of the index. These three, each bringing their own contribution, have constituted a team preserving the balance of the book in its many dimensional excursions.

Several friends have been good enough to read the book in typescript. To them I am deeply indebted for their comments and suggestions. Their encouragement has carried me through periods of discouragement, even dismay, at the task I was engaged in.

To the Committee of the Pioneer Health Centre, so generously supporting me financially in compilation of the book, I owe a special debt of gratitude; also to my publishers for the great understanding, thought and experience they have so consisently given to its production.

Three others must be mentioned: Mr. H. G. Casparius whose permission I have been freely given for reproduction of the photograph of G. Scott Williamson that appears on the frontispiece of this book; Miss Evelyn Tuke for her very present help in the final correction of the proofs; and last, my late secretary Miss D. E. Elms whose skill and close attention achieved so clear and accurate a typescript.

*I.H.P.*

# INDEX

**Starred entries appear in the **Dictionary of Quality**, pp. 279-305.*

The impetus for DR. SCOTT WILLIAMSON's life-work came in childhood when his curiosity was aroused by the fact that some people do not succumb to infectious disease. Pursuit of this problem of insusceptibility occupied him continuously and led directly to the question: What is Health?

After reading medicine at Edinburgh University, he set up a research laboratory into mental disease at Wakefield—the first of its kind in this country. He served in the 1914-18 war and then became Pathologist to the Royal Free Hospital. There he began his important research on the thyroid, later to be carried on at the laboratories of the Royal College of Surgeons and in the Dunn laboratories of St. Bartholomew's Hospital, and for which he was awarded a gold medal and M.D. by Edinburgh University.

From 1926-29 he and Dr. Pearse ran a small pilot experiment in Peckham before planning and founding the Pioneer Health Centre which, with its family membership, periodic overhaul and provision for the cultivation of health, attracted world-wide attention. When the Centre closed in 1951 for want of funds, he began the preparation of this book but died in 1953 before its completion.

DR. INNES HOPE PEARSE qualified in 1916 and became one of the first women house physicians at the London Hospital. As a woman she had exceptionally wide clinical experience before becoming Dr. Williamson's research assistant at the Royal College of Surgeons and at St. Bartholomew's Hospital. Ten years' experience in one of the first Infant Welfare Centres impressed upon her the inadequacy of that work outside a full family setting and led her to welcome the organisation and planning of the Peckham Experiment.

At the end of the Second World War she was sent by the War Office to lecture to all ranks in the Middle East on the work of the Centre, and later to do the same in Holland for the British Council. In 1948 she addressed the Community Service Society of New York at its Centenary Symposium and lectured also on the work of the Centre in the Departments of Public Health at Harvard, Yale and Johns Hopkins Hospital.

She shared in the planning of this book with her husband, and brought it to completion after his death.